Integrating The Monorail

READER'S GUIDE

DEIS Comments

City of Seattle Comments on the Seattle Monorail Green Line Draft Environmental Impact Statement

October 2003

City of Seattle

READER'S GUIDE

The City of Seattle's comments on the Seattle Monorail Green Line Draft Environmental Impact Statement (DEIS) are presented in sections to make them more accessible to the reader. The sections correspond to the six geographic segments that the Seattle Monorail Project is using for planning and environmental analysis of the Green Line project, and to four major elements of environmental impact identified by the City. In addition, a letter from Seattle Mayor Greg Nickels presents an overview of the issues he sees as critical to integrating the monorail into the city, and a Miscellaneous section includes detailed technical corrections recommended by the City and detailed section and page references for issues identified in the segment and element sections of the City's comments. The comment sections are listed below.

Integrating The Monorail

BALLARD

DEIS Comments

City of Seattle Comments on the Seattle Monorail Green Line Draft Environmental Impact Statement

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City of Seattle

OVERVIEW

The City's DEIS comments related to the Ballard segment emphasize the need to refine the alignment alternatives to achieve the best possible balance of access, mobility and urban form in the 15th Avenue NW corridor, the need to identify specific measures to mitigate impacts to parking supply and demand, and the need to more definitively describe project scope and design features that will make the Green Line consistent with neighborhood visions and plans.

ACCESS & MOBILITY

Because of sight distance requirements, the center-of-roadway alignment alternative will likely require restrictions to left-turns into and out of driveways and result in limited storage lengths for left-turn lanes at intersections. These appear to be unavoidable adverse impacts. The west alignment shows greater potential to be integrated into a roadway design that maintains the essential access and mobility functions of the roadway, but these design solutions may impact on-street parking. Additionally, even optimized side-of-street alignments may impact transit operations, freight mobility, and/or critical turning movements in some areas along the Green Line corridor, and specific mitigation measures must be identified in such instances.

Freight Mobility

The discussion of existing travel lane widths and turning radii required for truck movement states that these "could be maintained" (4-89). As a designated truck route, these must be maintained unless SMP has a different proposal.

The FEIS should give recognition that there is heavy truck demand and travel desires in the Ballard/Interbay area, in addition to the Duwamish area. They are both noted industrial areas, serving the maritime industry (4-8).

Level of Service and Congestion

Intersection operation must reflect current and planned lane configurations. At 15th NW and NW 85th Street, the northbound curb lane functions as a right turn lane since the far-side lane drops within a short distance (4-33). The intersection level of service (LOS) is expected to degrade for both the No-Build PM peak as well as with the project - and mitigation may be required for this intersection. Likewise, the northbound curb lane on 15th NW at NW Market Street functions as a right turn lane (with far-side taper to two lanes within 1-2 blocks) and should be modeled as such.

Morning peak hour traffic on 15th Ave NW currently backs up through the Holman Road/15th NW /Mary intersection, causing delays to existing side-street traffic (4-33). This is expected to continue into the future. Possible mitigation for degraded intersection operation on 15th Avenue NW at NE 85th Street may include reconstruction of the intersection including widening of the side street, to accommodate a change in signal phasing from split phase (east-west). Mitigation of degraded operation at 15th NW and NW Market Street may include realignment of the guide-way to retain the current lane configuration.

Traffic Operations

The center columns on 15th Avenue NW will disrupt current left turn capability, as noted. The FEIS should identify the extent and severity of truck trip diversion, which is undocumented (4-44). What restrictions will be imposed? Some potential impacts of truck diversions are: increased travel time, increased cost of transporting services and goods.

The discussion of mitigation of the 15th Avenue NW/NW Market Street intersection notes that "providing an additional northbound through lane at NW Market Street and tapering down to two lanes north of NW Market Street would provide

additional capacity at this intersection" (4-90). Such a lane already exists for northbound traffic, with a taper between NW 56th Street and NW 57th Street. Is an additional taper lane proposed, or is it recommended that the existing taper lane be extended further north?

The DEIS states that "construction of alignment Alternative 1.2…would likely be more disruptive" (4-492). Please be more specific about the nature and extent of impacts that would make this more disruptive. With respect to the following statement, "Disrupted access to some businesses could occur" - does this apply equally to all alternatives?

Transit Operations

The FEIS should identify the impacts of monorail facilities located in the roadway on the design and operation of the arterial system (such as signalization or channelization) and the resultant impacts on transit operations (speed and reliability). The FEIS should identify measures such as: off-street bus transfer facilities incorporated into station sites; in-lane bus stops; bus queue-jump facilities; exclusive transit lanes; and/or transit signal priority to avoid or minimize adverse impacts to transit speed.

Transit, Bicycle & Pedestrian Connections

The FEIS must include more definitive drawings and descriptions of the project facilities that will result in good intermodal connections such as effective bus transfers at Crown Hill and improvements to pedestrian access to those stations that may present access challenges. At minimum, space to accommodate future improvements necessary to attract and accommodate ridership should be provided at station areas.

The DEIS states that the "Project could benefit from sidewalk improvements" along NW 85th Street and "imporoved bicycle facilities" along 15th Avenue W. Is SMP proposing these improvements as mitigation? The mitigation section should not be a wish list of future City improvements, but a list of improvements required to mitigate project impacts (4-91).

Impacts to Parking Demand

The City believes that hide-and-ride parking impacts are inevitable within one-quarter mile of the Ballard segment stations unless parking management programs and measures are implemented. The Project Description should include a commitment to parking management programs and measures. The specific programs and measures can be identified later in the project design and approval process, with assistance from the City and input from neighborhood stakeholders. The Project Description should commit to implementation of parking management strategies before stations open, to avoid rather than react to hide-and-ride parking impacts.

Impacts to Parking Supply

Impacts to the parking supply should be mitigated through measures such as:

- creating new on-street parking nearby by converting unrestricted parking to short-term parking (through use of paid parking technology, time-limit signs, and load zones).
- identifying opportunities for shared off-street parking
- creating new off-street parking supply as part of a joint development or single-purpose parking facility.
- supporting development of a transportation management association or marketing programs that extend parking/transportation demand management tools to local businesses in the station area, to reduce auto travel demand to the area.

NEIGHBORHOODS & BUSINESSES

The FEIS should draw on the SMP's architecture and urban design programs to assess in greater detail the relationship of the Green Line to the Crown Hill/Ballard Neighborhood Plan and 15th Avenue NW Visioning Project, and should more definitively identify project scope and design features that will make the Green Line support of neighborhood visions and plans.

Business Access & Parking

The DEIS states that impacts of the partial acquisition and displacement of a portion of a drugstore/pharmacy parking could be mitigated (4-158). Specific mitigation strategies should be identified to address the partial acquisition and displacement of pharmacy parking.

The DEIS states that "with Alternatives 1.1.1 and 1.1.2, the analysis assumes that 45 new all-day parking spaces could also be provided between columns on the west side of 15th Avenue NW south of NW Market Street" (4-42). With respect to this segment of the alignment, where would the guideway leave the 15th Avenue NW right-of-way in the process of transitioning to the new bridge structure? Would the new parking spaces on 15th Avenue NW interfere with the southbound exit ramp from 15th Avenue NW to Leary Way?

The Land Use section states that Alternative 1.1 (west) "coud reduce parking availability if parking remains unrestricted" (4-140). Is this a proposal to restrict parking as mitigation? If so, the proposal should also appear in the mitigation section (or Project Description). Also, the Transportation section states that this alternative "would," not "could," eliminate parking spaces. Identification of impacts and mitigation should be consistent across sections of the DEIS.

Land Use & Development

In several places in the Ballard segment, residential uses are identified as being "within a block or two" (4-122). However, as figure 4.3.1 shows, residential uses are only 1/2 block away, immediately behind businesses. A more explicit description of the abrupt transition (or lack of transition) between the commercial uses along 15th AV NW and the single family uses would more clearly present the existing conditions.

The west side alternatives for the Ballard High and Crown Hill stations are immediately adjacent to low-density residential zones. This is not reflected in the statement, "given the predominantly commercial uses and limited residential uses immediately adjacent to the stations, the larger scale of the station buildings is not expected to substantially impair the existing use or future development of nearby properties" (4-140). The FEIS should discuss how residential properties immediately west of the proposed stations may be impacted by the development of station structures 60 to 65 feet in height. For example, the FEIS should better explain how "context-sensitive design" will minimize the effect of the Crown Hill (West) station on the neighborhood, given the significant difference in the height of the station (4-141).

In describing Alternative 1.1 (West Side of 15th), the DEIS states that the guideway or columns "could also reduce visibility to businesses but this is not expected to impair the use of the properties" (4-141). The FEIS should expand this discussion to show why the use of a property for business purposes would not be impaired by reduced visibility.

In appendix U-2, the statement is made that "preservation of mobility for freight and employees" is a key issue for the BINMIC plan. The FEIS should provide analysis as to how the project is consistent with this goal, if the FEIS will describe the Green Line as consistent with land use plans in this area. Revised alignment alternatives and specific mitigation measures will likely be necessary to support the claim of consistency.

Integrating The Monorail

INTERBAY

DEIS Comments

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OVERVIEW

The City's DEIS comments related to the Interbay segment emphasize the need to maintain freight mobility, the need to identify specific measures to mitigate impacts to parking supply and demand, and the need to more definitively describe project scope and design features that will make the Green Line consistent with neighborhood visions and plans.

ACCESS & MOBILITY

Traffic Operations & Freight Mobility

The EIS should give recognition that there is heavy truck demand and travel desires in the Ballard/Interbay area, in addition to the Duwamish area. They are both noted industrial areas, serving the maritime industry (4-8).

Peak period operation at the Galer Street overpass at 15th W/Elliott Ave W should be discussed in more detail in the FEIS, given increasing traffic related to the Amgen development and school bus operations at this intersection. The impact of the guideway on the roadway cross section and traffic operations at Elliott Ave W and Mercer Place should also be specifically discussed in the FEIS.

Alternatives in the vicinity of the W Galer Flyover must consider provisions and coordination of planning for a proposed EB to SB ramp from the Flyover to Elliott Ave W; alternatives in the vicinity of W Garfield St should mention provisions and include coordination and planning for the proposed Magnolia Bridge replacement (4-44).

Transit, Bicycle & Pedestrian Connections

The FEIS should include more definitive drawings and descriptions of the project facilities that will result in good bicycle, pedestrian and intermodal connections at the Dravus and Elliott/Mercer stations. Ridership at the Dravus station is largely dependent on bus transfers serving the Magnolia and North Queen Anne/Fremont areas. Ridership at the Elliott/Mercer stations is largely dependent on pedestrian connections to the Uptown neighborhood.

Parking Demand

The City believes that hide-and-ride parking impacts are inevitable within one-quarter mile of the Dravus station unless parking management programs and measures are implemented. The Project Description should include a commitment to parking management programs and measures. The specific programs and measures can be identified later in the project design and approval process, with assistance from the

City and input from neighborhood stakeholders. The Project Description should commit to implementation of parking management strategies before stations open, to avoid rather than react to hide-and-ride parking impacts.

The discussion of parking demand at the Howe station should more definitively address impacts and mitigation.

NEIGHBORHOODS & BUSINESSES

Manufacturing & Industrial Sector

The DEIS states that "the construction activities for the West Bridge Connection or East Bridge Connection could have a greater impact on tenants of Fishermen's Terminal." The FEIS should be more specific about the nature and extent of these impacts (4-493).

Regarding the ship repair operation impacted by the west bridge routes, the DEIS states: "reconfiguration of the site and the use of specialized equipment to allow ship repair business to continue without loss of business or employees." If relocation or reconfiguration is not possible, then the loss of the business should be identified as a significant adverse impact (4-142).

The FEIS should discuss the consequences of reduced moorage for fishing vessels. How many vessels would this affect? For

example, would there be loss of jobs or an impact to economic potential? The FEIS should expand the discussion (4-142).

Land Use & Development

The FEIS should provide more analysis of the relative land use impacts of the Dravus 1 and Dravus 2 alternatives (4-143).

In describing the Howe stations, the DEIS states that the station development is "not expected to conflict with redevelopment plans" (4-143) of the Tsubota Pipe and Steel plant site; the FEIS should explain the assumptions and reasoning behind the statement.

UTILITIES & CONSTRUCTION

The Canal - Broad 115 kV overhead transmission line would have difficulties existing on 16th Ave W just south of the overpass as shown in option 2.1.1. Both options on 15th Ave W will require the Canal - Broad 115 kV overhead transmission line to coordinate closely or relocate for crossing over the monorail. The monorail crossings shall meet all applicable codes and in specific Table 232-1 of the NESC 2002 (or current version). Codes shall be based on a line to line voltage of 242 kV (4-286).

NATURAL ENVIRONMENT

The DEIS does not address the potential accumulation of explosive levels of methane gas in enclosed spaces. Mitigation measures must be addressed in a report prepared by a licensed civil engineer, and these measures must be incorporated into the project plans. A final report will be required from the engineer confirming that the methane accumulation mitigation measures have been constructed in accordance with recommendations contained in the report (4-383).

The FEIS should indicate that all construction over the landfill shall be performed in accordance with an excavation and development work plan prepared by an engineer with experience with landfill construction, and the project shall comply with all applicable regulations to prevent damage from methane gas buildup, subsidence, and earthquake induced ground shaking. Technical studies shall be performed to demonstrate the safety of the development sited upon the landfill (4-385).

Regarding landfill hazard mitigation, the FEIS should indicate that all development on landfills shall be performed according to an excavation and development work plan prepared by a licensed engineer with experience in landfill construction and/or management (4-543). The development must comply with all requirements to prevent damage from methane gas buildup, subsidence, and earthquake induced ground shaking. Technical studies shall be required to confirm that the development will be safe from hazards associated with construction on a landfill. Development on landfills must adhere to all relevant requirements of the Seattle-King County Health Department and other agencies. See Regulations for Environmentally Critical Areas, Seattle Municipal Code Section 25.09.220.

There is no mention of shade impacts on the Interbay P-Patch. Since the purpose of the P-Patch is for growing plants and since plants require sun, shade impacts are not just aesthetic but operational. (4-304)

At the Interbay Operations Center, will construction impacts, such as dust, have an effect on plants in the Interbay P-Patch? (4-493)

Integrating The Monorail

UPTOWN
SEATTLE CENTER
BELLTOWN

DEIS Comments

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OVERVIEW: UPTOWN/SEATTLE CENTER

The City's DEIS comments related to Seattle Center emphasize the need to exhaustively identify impacts and mitigation associated with the landscape, urban forest, facilities and tenants of Seattle Center; the impacts of the Mercer Route on the Theater District Plan and future Mercer corridor traffic system alternatives; and the need for a comprehensive construction mitigation agreement.

OVERVIEW: BELLTOWN

The City's DEIS comments related to Belltown emphasize the potential advantages of a revised west alignment on 5th Avenue that may allow existing trees to be retained, minimize displacement of businesses of importance to the community, and provide access and mobility comparable to the west alternative studied in the DEIS.

ACCESS & MOBILITY

Traffic Operations

The Mercer alignment alternative would constrain future opportunities to modify traffic operations on this portion of Mercer Street. The City is currently studying operational options for the Mercer Corridor.

The center alignment on 5th Avenue through Belltown would be designed differently from the existing monorail system, to meet contemporary safety standards for sight distance. Access to travel lanes to either side of the guideway would be restricted, which would adversely effect transit operations and emergency vehicle access. The west alignment, or a revised west alignment that has been proposed by the SMP urban design program, would avoid these operational impacts and provide a similar level of service.

The FEIS should identify mitigation measures to address Denny Way level of service changes at Broad and at 5th (4-55).

Alternatives 3.1, 3.2, and 3.3 would add 6.5 average seconds of delay to traffic moving through the Denny Way/Second Avenue intersection, which would be a significant worsening of delay (4-55).

Transit, Bicycle & Pedestrian Connections

The City has appreciated the opportunity to participate in the development of a new station concept for the 5th & Broad station that provides increased capacity to serve events at Seattle Center, and we understand that this new alternative will be included in the FEIS.

The DEIS notes that pedestrian "pinch points" on Seattle Center grounds may be affected by alignment alternatives 3.1 or 3.3, but does not discuss what pinch points might be impacted by the latter alternative, or how such impacts might be mitigated (4-57).

The discussion of pedestrian activity includes a table, 4.1-36, which shows peak hour ingress/egress at the stations in the area. However, as these stations will serve event crowds, after the PM peak hour, some discussion of event service, and the pedestrian LOS at sidewalks and intersections near stations would be appropriate. This is particularly important for the 5th/Broad station, which requires pedestrians to cross a major street to access it from Seattle Center (4-58).

Seattle Center Theatre District on Mercer Street

The DEIS does not explicitly acknowledge the inconsistency of the Mercer Street alignment in relation to Theatre District Plan, an integral part of the amended Seattle Center Master Plan. The Theatre District Plan proposes a reconfiguration of Mercer Street that preserves its through-arterial role, while also enhancing the pedestrian/drop-off safety and character. This is accomplished by designating three

northern lanes, each 11 feet wide, as through arterial lanes, creating a 3 foot green median separation to give pedestrians an interim landing point, and has a slow through lane and a drop-off lane south of the green median for the adjacent theaters and the ballet school. The choice in the Theatre District Plan was to improve pedestrian access and safety for both neighbors and visitors on Mercer, while respecting the importance of Mercer as an arterial for freeway access. And, the Theatre District Plan envisioned Roy Street as the northern boundary of the district, as it considered both bicycle and vehicular traffic, as well as pedestrian use, of both streets.

The Mercer alternative calls for an expansion of the north sidewalk of Mercer by 8 feet to accommodate monorail columns. The Mercer alternative maintains the existing four lanes of traffic, by narrowing lanes to 11 feet and moving them to the south. The consequence of this is to eliminate any capacity to establish a mid-point green median, a traffic-quiet thru lane and drop-off lane, as reflected in the adopted Theatre District Plan. Perhaps equally important, the existing condition for drop-off at the Theatres and the Ballet School would be compromised by the Mercer alternative, as the four thru traffic lanes take precedent and any drop-off area on the south side of the street is reduced to 3-6 feet, adjacent to a fast traffic thru lane.

A route alternative could mitigate the adverse impacts to the Theater District Plan. This alternative would shift the alignment further north, off the right-of way, going over the Mercer St garage and over or around the buildings on the north side of Mercer between 4th and 5th. This new alignment would allow the channelization of Mercer as proposed in the Theater District plan.

Landscape and Open Space

The west alignment through Belltown would require removal of existing London Plane trees and limit future landscaping opportunities. A revised west alignment that could allow retention of these trees or replacement with significant trees should be considered, as proposed by the SMP urban design program.

Seattle Center would like to walk-through the routes with the appropriate EIS consultants and City Arborist representatives to more fully and commonly understand the impacts on trees and landscaping of the route alternatives. This would ensure a complete and accurate inventory in the FEIS. It is unclear how many trees would be removed (or trimmed) under each alternative (4-202). Seattle Center will work with SMP to develop construction plans that avoid tree removal to the greatest extent possible and to carefully plan and select replacement trees and landscaping when displacement occurs to meet a holistic program of vegetation type and maintenance for the Center.

The FEIS should acknowledge that mitigation for landscaping and street trees must include compensation based on the appraised value of the trees and the replacement costs for shrubs, perennials, and ground covers, including lawns (4-561).

In the FEIS, the discussion of the Northwest Route should further explain the conclusion that the alternative "would not cause significant impacts to passive enjoyment" (4-58); given this has become a focus of the discussion of route alternatives, further discussion would be helpful.

The London Plane trees growing along the Mercer St. corridor are of concern to Seattle Center. Views into the garage must be maintained as a matter of safety and security for our patrons parking in the garage. This should be considered in the placement of trees along this corridor (4-450).

The FEIS should commit to matching any decrease in green space in one area with an increase in another area at the Center by the SMP (4-450).

The DEIS identifies tree trimming to maintain clearance for the guideway as an operational impact (4-456). The FEIS should be definitive if the SMP is committing to undertake tree trimming or reimbursing Seattle Center for the costs as mitigation. (The current cost of pruning a London Plane tree by a certified arborist is about $200.)

The DEIS notes that "during quiet times in the Center, the Green Line would be clearly audible at outdoor locations near the Northwest Rooms and on the lawn north of the International Fountain." One way to mitigate this impact would be to enter into an operating agreement with Seattle Center to specify the types of situations in which the Monorail would agree to reduce it's speed over the Fountain Lawn portion of the route (4-276).

Views, Aesthetics & Historic/Cultural Resources

The DEIS does not analyze the streetscape and urban form impacts of the monorail running at a higher height down 5th Avenue than the existing monorail, which have been analyzed as part of the SMP urban design program; the FEIS should incorporate this analysis (4-147).

Guideways within 10 feet of historically significant apartments would alter the setting resulting in a mid to high visual impact on the building. (4-201)

The view from Marion Oliver McCaw Hall/ Kreielshiemer promenade includes the greenbelt at the west end of Memorial Stadium. The loss of trees in this area would change the backdrop of layers of trees that currently exist in this view, and the guideway cutting across from the southwest corner of the stadium would become a major new element from this perspective (4-179).

The trees in the greenbelt at the west end of Memorial stadium are part of the green framework of the Seattle Center grounds. Removal of a significant number of these trees will affect the visual quality and site lines throughout the campus (4-203).

All alternatives except for Alternatives 3.1 and 3.1.2 would have the visual impact of removing the monorail guideway from the EMP. The EMP was designed with the monorail as an integral component, removing it will conflict with the original design intent and leave a "hole" in the building which is a negative impact that should be mitigated.

Parking stalls removed from the 5th Ave lot (Alternative 3.2) should be considered a displacement. Each stall in this lot is a revenue producing stall, and due to their location, they are some of the best stalls in the lot, so mitigation would have to compensate for this loss (4-112).

The DEIS notes that, for Alternative 3.5, the removal of the Frol Building parking structure could be mitigated. Specific mitigation strategies should be identified. (Land Use Section)

In Alternative 3.5, after demolition of parking, how much parking would remain in the area? Would the benefits of "increased access and mobility" mitigate the impact? In the Downtown segment, it is stated that loss of parking supply is offset by the supply of paid parking in downtown; does this also hold true for the Denny station which has parking lots nearby and good transit service (4-149)?

Thirty-two spaces would be lost in the Key Arena lot (Alt 3.3, 3.5) These spaces are used for team member parking, and service vehicles directly related to Key Arena event staging (4-59).

The DEIS states that "some on-street unrestricted parking losses are also expected on Harrison Street (all alternatives) and Warren Avenue (Alternative 3.2)" which are on the North and West side of Seattle Center, and implies that available capacity of metered/restricted parking on the East and South will compensate for this loss. The distance is

too great for this to be a realistic assumption. Additionally, unrestricted and restricted parking serves two different purposes, and they are not interchangeable. The appropriate comparison (ignoring the distance involved) would be with unrestricted space on the east side, which is, according to Appendix O, 94% occupied during midday. The FEIS should identify this impact (4-60)

Displacement and Economic Impacts

The DEIS does not fully identify or address impacts on Seattle Center facilities and replacement/mitigation plans. The following are the affected facilities that should be addressed in the FEIS with the indication of which routes should address impacts:

EMP (NW and Mercer Routes);
Fun Forest (NW)
SC Nursery (NW)
SC Propane Tank Storage (NW)
Northwest Rooms (NW or Mercer)
Key Arena North Tunnel Operations Facilities (NW or Mercer)
Paid parking stalls loss in 5th Ave Lot (Mercer)
Construction impacts on all event facilities related to ingress, parking, and egress (NW and Mercer)
Seattle Center Monorail System

The FEIS should affirmatively reflect the responsibility of SMP to replace facilities displaced by the new monorail, to pay for relocation and interim operation of displaced facilities during construction, and to mitigate unavoidable adverse impacts.

The Fun Forest is a tenant of Seattle Center, and a portion of the rent it pays is related to Seattle Center income. If the Fun Forest's income is reduced due to the removal or relocation of rides, there will be a negative impact to the Seattle Center budget. Mitigation should be proposed for this loss, such as compensation.

If the Fun Forest can not be relocated on site (since there is not a commitment to this mitigation), what are alternative mitigations? (4-145)

The SMP will need to rebuild the NW Rooms and find a location for the tenants that are displaced during construction. Additional mitigation may also include loss of revenue related to the temporary or permanent displacement. Similar mitigation measures would also be required for impacts to Key Arena or Center operations buildings including Blue Spruce, SC Pavilion, NASA Building, Sonics shop, etc. under Alternatives 3.3 and 3.5. (4-111; 4-144)

Referring to the Northwest Rooms, the DEIS states "In cooperation with Seattle Center, these facilities could be replaced within a new Queen Anne/Seattle Center station structure." This should read "will be replaced." SMP must be responsible for replacement costs (4-144).

Noise and Vibration Impacts

We applaud SMP for their attentiveness to the concerns of many Seattle Center resident organizations on how the new monorail might affect their businesses. The FEIS should include specific quantifiable standards defined for noise and vibration impacts by facility, during construction and during ongoing operations, and mitigation commitments related to construction.

While the project would reduce noise impacts at Tilikum Place on a train-by-train basis, the frequency of trains is greatly increased; the FEIS should discuss the net impact (4-304).

Construction Impacts and Mitigation

Seattle Center will require that SMP enter a Construction Management Agreement (CMA) with Seattle Center. The scope and focus of the agreement will differ somewhat depending on the route but the basic principles and purposes of the CMA will be the same.

Generally, Seattle Center CMA's define how a contractor will conduct construction

activities on the Seattle Center campus with the aim of ensuring that event activities, pedestrian access, and protection of the natural environment of the campus are respected by and unimpeded to the maximum extent by construction activities. At the same time, the CMA provides clear directions on our site standards (for example, tree protection requirements) and a construction management and coordination process designed to enable the construction activities to proceed with as much clarity and certainty as possible.

We would expect a CMA between Seattle Center and SMP to be passed-on as part of the construction contractor's contractual requirements. As an illustration, we would expect the CMA to address, among other items, such matters as:

- Permissible times of the year, days of the week, and hours of construction activities by type of activity. For example, the CMA might require that only quiet construction activities could occur during hours of theatrical performances.
- Pedestrian access and egress and wayfinding and accessible route signage.
- Construction staging areas, excavation disposal haul routes, SC service vehicles access, campus security requirements; and construction close-up, safety, and clean-up required during events.
- Noise and vibration mitigation.
- Tree and landscape protection to meet Seattle Center site standards.

The Final EIS should define more fully expected noise and vibration impacts for performance and business venues during construction for both the Mercer and Northwest Routes and traffic impacts and mitigation during events for the Mercer Street route. Further, the FEIS should acknowledge specifically its intent to mitigate construction impacts via a Construction Management Agreement with the Seattle Center.

Utility Relocation

Alternative 3.2 will impact the Canal - Broad 115 kV underground transmission line. All options pass very close to the Broad Street substation, at Broad and Thomas, where transmission, distribution, and network facilities are concentrated. It is highly desirable for the alignment and foundation locations in this area to avoid conflicts with these facilities. (Public Services & Utilities Section)

The relocation of steam utilities on Seattle Center grounds should be discussed in the FEIS (4-512).

Other Construction Impacts

There is no mention of construction impacts to the Northwest Rooms during the construction of the Queen Anne station, or of consequent mitigation. These are revenue generating rooms used for meetings and events, and the lost revenue will need to be mitigated. (Construction Section)

Natural Environment

The statements about the affect of tree removals on urban birds in is based on assumptions that are not supported by bird census data obtained by field studies in the impacted area. Obviously, there are no large habitat reserves in the Queen Anne and Belltown area. To retain existing bird species, all green belts and tree cover should be considered as potential and valuable habitat. Casual observation reflects that there are still a number of valuable native bird species that use the trees and green belts in segment 3. These birds enrich the life of the City and the birds' need for this resource for survival should not be under valued. (4-558)

Seattle Center's Landscape staff maintains a plant holding area and landscape storage facility at the southwest end of the Memorial stadium site. This site has two storage

buildings, power and lights, an irrigation system, graveled roadway and is secured by the stadium wall and chain link fence with a sliding gate. This area is not under the proposed location of the guideway but, construction could impact this area. This site is an integral part of the Seattle Center's landscape maintenance and landscape construction operations. There is no apparent alternative location at Seattle Center for this facility. (Plants & Animals Section)

Integrating The Monorail

COMMERCIAL CORE & PIONEER SQUARE

DEIS Comments

City of Seattle Comments on the Seattle Monorail Green Line Draft Environmental Impact Statement

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City of Seattle

OVERVIEW

The City's DEIS comments for the Commercial Core and Pioneer Square segments emphasize the challenges associated with:

- Utility relocation and associated construction impacts to traffic operations, commercial activity and the quality of life; and
- Ensuring the urban design and landscape choices associated with the alignment, guideway design and streetscape improvements maintain the high-quality built environment and pedestrian environment of the area.

ACCESS & MOBILITY

Intermodal Connections

To support and promote ridership, it is essential to design for seamless connectivity between the monorail and other modes of transit. The FEIS should include more definitive drawings and descriptions of the project facilities that will result in good intermodal connections at major transit hubs such as King Street Station and Westlake Station.

Bicycle Mobility

The FEIS should identify mitigation for removal of the 2nd Avenue bike lane in Alternative 4.3 or identify this as a significant adverse impact (4-66).

NEIGHBORHOODS & BUSINESSES

Removal of the existing monorail station in Westlake Center may reduce the number of people using the space (4-304). What would the impact be on the vitality of Westlake Center, Plaza, and Park, respectively? SMP architecture and urban design studies have proposed an elevated walkway connection to Westlake Center to mitigate this impact; the walkway should be included in the Project Description, or the land use, neighborhood and economic impacts should be fully disclosed and alternative mitigation proposed.

Views, Aesthetics & Historic/Cultural Resources

The discussion of neighborhood impacts in the Downtown segment notes that "the visual and setting impacts to historic resources would affect the visual context of some historic resources, particularly in Pioneer Square. However, the improved access to the Pioneer Square Historic District and the Pike Place Market Historic District would likely benefit continued economic vitality". It is not clear how enhancing economic vitality will reduce impacts to the visual context of historic resources (4-149).

The "Walrus level" (2nd & 3rd story belt course) on downtown historical resources is comparable in significance with other visual resources. The Walrus level should be included in list of visual resources (4-190).

The Seattle Space Needle is a prominent feature visible from the Downtown area, on-axis, above Second Avenue. The analysis should address this view. (Visual Quality Section)

The document reports that shade impacts on the Garden of Remembrance and the Washington Mutual Tower plaza would be low because of shade created by existing trees. The shade created by trees is not the same quality as that of the guideways. Shade from trees is not uniform and, since they are deciduous, would be very minor in cooler months because leaves are gone. In addition, shade from guideways onto trees could negatively affect their viability. The FEIS should expand the discussion of these issues to reflect these differences (4-212).

The Madison 2 station would create significant negative shade impacts on both the open space and plantings of the Wells Fargo Building; this should be described in the FEIS. (4-212)

The FEIS should be more definitive in statements about visual impacts to architectural features; specific references are provided in the Miscellaneous section of the City's comment letter.

The impacts to Westlake Center and the downtown retail core after the existing monorail is taken down and before the Green Line is operational should be discussed in Construction Impacts (4-150). 4-305 First paragraph. Similar to the aesthetic impacts on Smith Tower because of the contrast in historical period, the Monorail would have an aesthetic impact on Pioneer Square. (Park & Recreation Section)

Areaways within the Pioneer Square National Register Historic District are not accounted for in the description of impacts related to station construction, are not accurately or consistently represented with regard to eligibility for the National Register of Historic Places, and are not accurately or consistently discussed within DEIS discussion of Green Line operation and construction impacts. Detailed references to areaway issues in the DEIS are included in the Miscellaneous section of the City's comment letter.

King Street Station is situated precisely on the dividing line between the Downtown and SODO segments, leading to confusion as to which DEIS section addresses impacts. There is insufficient representation and clarification of impacts to King Street Station resulting from operation and construction of both the Green Line and the Weller/King Street Station. Table 4.11-3 on page 4-333 finds adverse visual effect to King Street Station resulting from the Green Line. Operational effects are addressed on page N-189 and N-190 finding the station listed on the NRHP and that it would be visually adversely affected from the Green Line operation. This does not, however, address specifics of visual obstruction, dividing the tower and altering the visual relationship between the station and the Pioneer Square Preservation District. The station is also correctly listed in Table 4.17-6 and Table N-3 on pg N-200 as "very sensitive." However, on page 4-213 Alternate 5.1 and 5.2, there is no statement that obstruction of views of the King Street Station will have an adverse visual impact. There is no mention of the Weller/King Street station visual, construction and operation impact on the King Street Station (N-209).

Land Use & Neighborhoods

Regarding the east and center Pike Street station alternatives (4-151/2), if the Pike 2 (East) station alone is a substantially less dense use than what existing zoning could allow, the FEIS should evaluate consistency with the Commercial Core neighborhood plan and articulate why the Pike 3 (Center) station is "less compatible with surrounding existing or planned uses."

The DEIS refers to reviews of the Vancouver Sky Train system and mentions that "office and commercial workers and residents have a lower sensitivity over time to the passage of trains by their windows. As a result, existing adjacent office, commercial, and residential uses should not be adversely affected by the visual presence of the Green Line" (4-150). The fact that the facility desensitizes residents and office workers to impacts over time is not mitigation of the original impact; the FEIS should describe any impact.

The FEIS should discuss the land use impacts of demolition of the Sheridan Apartments associated with Alternative 4.2 (4-151).

UTILITIES & CONSTRUCTION

Traffic Impacts

The routes immediately parallel to the Green Line alignment that could also experience temporary traffic increases due to added traffic from temporary detours should be identified to the extent possible and the anticipated volume increase projected, again to the extent possible. This information could then be used as a basis for mitigation

efforts as described in 4.17.10.1. This will be particularly critical for the Downtown segment when Second Avenue is impacted by construction. The impact will be compounded if the DSTT is closed in 2005 for light rail retrofit due to the added bus volumes and the fact that Third Avenue will be "transit only" during the AM and PM peaks (4-483).

Utility Relocation

Alternative 4.1 on the west side of 2nd Avenue proposes to eliminate the north-south duct run in 2nd Avenue. It is also possible that there will be an impact on the east-west duct banks as well. In this case, then impacts can increase significantly. Temporary and permanent relocation of civil and electrical plant would be required, resulting in two moves of impacted City Light (SCL) facilities (4-470).

Alternative 4.2 on the east side (north of Marion) and west side (south of Marion) of 2nd Ave proposes to eliminate the north-south duct run in 2nd Ave from south of Marion to Yesler. This alternative may produce about 50% of the civil impacts and 2/3 of the electrical impacts of alternative 4.1. Again, if east-west duct banks would be impacted, then the mitigation would be significantly higher. This alternative has a few locations where steam relocations could impact SCL plant (4-470).

Alternative 4.3 in the center of 2nd Avenue features station locations that may impact the 2nd Ave duct run, requiring relocation of the north-south ducts and manholes. There are a large number of east-west duct banks which could be impacted by this alternative, but that risk may be eliminated when column placement is finalized. The cost and time required to mitigate this alternative may be significant, but will likely be relatively small compared to the other two alternatives. A fairly low percentage of relocations would likely require temporary relocation resulting in two moves. A special problem with this alternative is the impact on SSC steam plant. If steam lines are relocated, their new placement must not impact present or relocated SCL lines. In general, steam lines must be 12 to 13 feet away from SCL duct banks to have minimal impact. If steam lines must be relocated to positions within 13 feet of SCL facilities, cable ratings will be reduced unless mitigated. An engineered solution to restoring cable ampacity will be required at locations within 13 feet of SCL plant (4-470).

Based on available information about proposed structures, construction methods, clearances needed and structural considerations, SCL does not anticipate that it would be possible to locate the Green Line along the west side of Second Avenue without moving existing electrical equipment. Somewhere in the FEIS there needs to be a clear statement about the significance of impacts resulting from selection of the West alignment. The construction period would be longer and the impact on services potentially greater than other alignments. The DEIS only states: "Utility relocations are discussed in the footnotes of Table 4.17-8 and the narrative in Section 4.9.3. Notable relocations are distinguished by their size, quantity, and/or impact on services." What is meant by notable in the context of SEPA and significant impacts? A clear statement indicating there are significant adverse construction impacts associated with relocation of major electrical equipment such as the vaults and ducts along Second Avenue should be made in the FEIS (4-513).

City Light agrees with the conclusion that Alternative 4.1 would be the area with the most electrical facilities affected (4-523). The duration of construction impacts is not stated in the DEIS. SCL estimates relocation of existing electrical facilities along Second will be a multi-year project. This information needs to be contained in the FEIS and cross-referenced into the assessment of construction impacts. Please state Alternative 4.1 along the West Side of Second could require the relocation of a large number of electrical facilities. Relocation of these duct banks would, not could, be costly and time consuming (as

long as ten years), and result in disruptions to service in this high-density retail and business district in order to establish parallel lines. Future detailed engineering analysis may reduce the number of relocations needed.

In discussion of Potential Mitigation for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains, the DEIS proposes "work with City Light to develop a cost-effective solution and schedule for potential electrical duct bank relocations" (4-531). If the west Second Avenue alignment is selected, it may not be possible to develop "a cost-effective solution and schedule." SCL is not able to comment on the feasibility of this proposal as mitigation, as parameters for cost effectiveness and schedule for completion of relocation are not given. Selection of another alignment would mitigate the construction impacts of duct bank relocations and should at least be considered as possible mitigation.

Integrating The Monorail

SODO

DEIS Comments

City of Seattle Comments on the Seattle Monorail Green Line Draft Environmental Impact Statement

October 2003

City of Seattle

OVERVIEW

The City's DEIS comments related to the SODO segment emphasize the need to maintain freight mobility and the land use and economic impacts of the potential displacement of the Home Depot store.

ACCESS AND MOBILITY

Freight Mobility

Truck turns from side streets are difficult to accomplish for medium to larger trucks. Trucks need more time to accelerate into traffic and cross traffic streams. Further analysis should be undertaken to identify problem locations where monorail structures may displace existing truck access. When U-turns and U-turn routes are required for both trucks and automobiles along the Green Line Route and where truck left-turns may become restricted by the project, U-turn routes and U-turns will need to accommodate WB-67 vehicles, without adverse impacts to any residential or local streets. Where Truck-U-Turns and turn movements are expected and impacted mitigation may include; new signals, new left turn signals, new left turn lanes, signing and development of new U-turn Routes for trucks--these U-turn routes may utilized arterials or non-arterial industrial streets (4-44.)

The DEIS states that in SODO the Green Line would run along South Horton Street to cross the Burlington Northern Santa Fe (BNSF) tracks and SR 99. Spokane Street is the southern limit of alternatives currently under consideration for the AWVSRP. No changes are under consideration for the AWV itself in the vicinity of Horton, but there are potential changes to the rail crossings. One of the options under consideration by the AWVSRP involves relocating the Burlington Northern Santa Fe SIG rail yard to the south. This shift would increase the number of places rail tracks cross South Horton Street between First Avenue South and East Marginal Way. Plans for the Green Line structure (e.g. pier locations) along Horton Street should take this possibility into account. (Also see 3-38 and 3-85)

Transit, Bicycle & Pedestrian Connections

The Lander Street station may have significant ridership potential given its proximity to the Starbucks Tower, which houses approximately 4,000 employees. The FEIS should incorporate a circulation plan for the station area, as further described in the Transportation section of the City's comment letter.

NEIGHBORHOODS & BUSINESSES

Manufacturing & Industrial Sector

The potential impacts of alignment alternatives to existing businesses should be identified and clearly differentiated in the FEIS and discussed in the context of the City Comprehensive Plan goal of retaining and attracting manufacturing and industrial sector businesses. For example, the DEIS does not describe how the east and west alignment alternatives on Third Avenue S would impact existing businesses.

Monorail Operations Center

The land use and economic impacts of the displacement of the SODO Home Depot store should be discussed in more detail in the FEIS. The store generates $70 million per year in gross sales, significant City sales and business & occupation tax revenue (approximately $6 million/year), and approximately 400 jobs.

UTILITIES & CONSTRUCTION

Public Services

The FEIS should acknowledge the following public safety and litter problems that may be of concern in the SODO area: graffiti removal from structures and pillars; accumulation of litter and debris around stations; and facility safety. The FEIS

should identify Crime Prevention through Environmental Design measures in the Project Description to keep the Green Line safe and free of negative activity.

Integrating The Monorail

WEST SEATTLE

DEIS Comments

City of Seattle Comments on the Seattle Monorail Green Line Draft Environmental Impact Statement

October 2003

City of Seattle

OVERVIEW

The City's DEIS comments related to the West Seattle emphasize the need to refine the alignment and station location alternatives to avoid or minimize impacts to the natural environment, the need to identify specific measures to mitigate impacts to parking supply and demand, and the need to more definitively describe project scope and design features that will make the Green Line consistent with neighborhood visions and plans.

ACCESS & MOBILITY

Because of sight distance requirements, the center-of-roadway alignment alternative on California Avenue SW will likely require restrictions to left-turns into and out of driveways and result in limited storage lengths for left-turn lanes at intersections. These appear to be unavoidable adverse impacts. The west alignment shows greater potential to be integrated into a roadway design that maintains the essential access and mobility functions of the roadway.

Traffic Operations

The DEIS states that "for analysis purposes, the Green Line could include a new traffic signal at the SW Avalon Way/SW Genesee Street intersection…" The analysis presented in this report assumed the presence of that signal (see page 4-75); it should be clearly stated that this signal will be provided (4-76).

The DEIS states that "Columns could be located to minimize impeding side street intersections, driveways, or loading docks, and to provide adequate sight distance around the columns." However, substandard width is a significant impact on California Avenue due to the inability (in the SMP proposal) to accommodate fire and life safety issues. SMP should develop a set of mitigation tools and alternative strategies to address the Fire Department's standards given parking and narrow lane widths (4-79).

If the guideway does not meet 20' vertical clearance above the roadway on California Avenue, oversized vehicle movements on California Avenue SW would be limited. This may have significant impacts on movements on California Avenue SW and other parallel arterials. The FEIS should discuss alternative routings and mitigation of this issue (4-83).

The FEIS should delete the discussion of "traffic circles" or "roundabouts" to reflect analysis completed after the publication of the DEIS, indicating that adequate turning radii cannot be accomplished without extensive property acquisition and widening of intersections (4-97).

Transit, Bicycle & Pedestrian Connections

The FEIS should include more definitive drawings and descriptions of the project facilities that will result in good intermodal connections such as effective bus transfers at Delridge and Avalon and improvements to pedestrian access to those stations that may present access challenges. At minimum, space to accommodate future improvements necessary to attract and accommodate ridership should be provided at station areas.

Impacts to Parking Demand

The City believes that hide-and-ride parking impacts are inevitable within one-quarter mile of the West Seattle segment stations unless parking management programs and measures are implemented. The Project Description should include a commitment to parking management programs and measures. The specific programs and measures can be identified later in the project design and approval process, with assistance from the City and input from neighborhood stakeholders. The Project Description should commit to implementation of parking management strategies before stations open, to avoid

rather than react to hide-and-ride parking impacts.

Impacts to Parking Supply

Due to the size of the West Seattle segment, parking is added in areas at a substantial distance from where displaced. Short-term parking in commercial areas serves different parking needs than unrestricted parking in residential areas. The FEIS should acknowledge that replacement parking may not entirely serve the needs of those in the displaced parking areas (4-81).

Impacts to the parking supply should be mitigated through measures such as those described in the Transportation section of the City's comment letter.

NEIGHBORHOODS & BUSINESSES

The DEIS states that "the guideways would be generally at or lower than zoning heights allowed for new buildings; but in Morgan Junction where zoning limits buildings 30 to 40 feet in height, station structures could be up to 20 to 30 feet higher. However, the development of California Avenue SW varies between commercial uses and residential uses". It may be more appropriate to note that the stations would likely be elements of distinction in this area, and that the City's Land Use Code has been amended to provide guidelines for integrating the necessarily higher stations into their environs. As with the Ballard segment, the commercial zoning along California frequently is only half a block deep; stations located on the west side of California may have substantial impacts on residential properties immediately west of the station sites (4-154).

Morgan Junction is identified as a medium to large-scale commercial district, despite its 30' zoning height limit. The FEIS should correct this inconsistency (4-218).

The shade/shadow and other visual impacts of a cross-over structure may result in moderate to high impacts on the commercial district (4-217). This should be discussed in the FEIS.

In Alternative 6.1 and 6.2, the land use and economic impacts of the high end of the range in reduction to parking supply should be discussed in the FEIS and mitigation should be identified (4-81).

NATURAL ENVIRONMENT

Longfellow Creek

There are a variety of potential impacts to Longfellow Creek that are discussed in various sections of the DEIS; it would be helpful if the FEIS could provide a consolidated analysis of these impacts, perhaps in the Cumulative Impacts section. For example, it would be helpful to capture the combined visual and noise impacts of the train and of increased traffic and transit activity would be expected to detract substantially from the sanctuary quality currently offered by the Longfellow Greenspace for the public, fish and wildlife (4-215).

The entrance to the culvert at SW Andover Street is the point of entry for all the coho and chum salmon entering the daylighted portion of Longfellow Creek. The proposed site alternatives of the Delridge Station and guideway presented in the DEIS are limited to locations in or adjacent to this sensitive area. Noise, pedestrian and vehicular traffic, increased runoff and water pollutants from impervious surfaces are all existing concerns for salmon and creek health. The addition of impacts introduced by the construction and long-term operation of the station and guideway, in combination with the additional impacts of anticipated future on-street support facilities for the Green Line are all of concern. We understand that SMP is working to refine alignment alternatives in the vicinity of Longfellow Creek to avoid or minimize encroachment on the Creek and its floodplain. We are supportive of your investigation of such alternatives.

In Section 4.12.4.2 - Segment 6 West Seattle Segment, the FEIS should provide more information on the risk levels associated with disturbing the five documented EDR release sites adjacent to Delridge 1 and 2. The leading hypothesis for the cause of coho pre-spawning mortality is water pollution, and metals and PAHs are among the candidate pollutants under investigation (Katherine Lynch, Urban Creeks Biologist, SPU, personal communication). Additional releases of these pollutants during construction could impact the Delridge/Longfellow Creek site (4-363 to 4-365).

The DEIS should make it clear that selection of the location of the guideway and station will both set in motion and limit the siting of future support-facilities in the immediate area, which potentially increases the level of encroachment on Longfellow Creek. Both of the DEIS alternatives allow for development of on-street facilities (bus facilities, layover facilities, and potentially for commercial/ retail facilities). The DEIS gives the impression that there is a recognized need for support-facilities. On-street support facilities are expected to have greater impacts to the creek (pedestrian and vehicular traffic, noise, pollution) than the spanning structures of the guideway and the station. Siting the guideway and station so close to Longfellow Creek would increase the probability that the completed development (Green Line and support facilities) would further impact Longfellow Creek. (Project Description Section)

The DEIS should specify where the location of the optional bus facilities to "the south of the station" would be. The concern is that siting the station and guideway close to Longfellow Creek increases the likelihood that the bus facilities also will be located close to the creek and would increase level of impact to the creek (parking lot runoff, pollutants, noise, pedestrian and vehicular traffic from a large on-street facility). (Project Description Section)

The description of impacts for area near Longfellow Creek Greenspace should summarize number and type of trees removed and address the extent of the resulting impact to the character of the surroundings (4-215).

Visual impacts on Longfellow Creek should be categorized as "high" rather than "moderate to high" (4-215).

The description of impacts for the area near Longfellow Creek Greenspace should summarize number and type of trees removed and address the extent of the resulting impact to the character of the surroundings (4-217).

In Section 4.10.3 - Mitigation - Mitigation of impacts to the Longfellow Creek Greenspace through increased lighting and/or access would be of questionable improvement as these would continue to detract from the quality of the site for both people and wildlife (4-306).

Whereas the Executive Summary reports that "there would be no significant unavoidable adverse impacts on parks", Section 4.10.4 indicates that the project would result in significant unavoidable adverse impacts on Longfellow Creek Green Space. The City concurs with Section 4.10.4 and suggests that comments to the contrary elsewhere in the document should be made consistent (4-307).

At the Delridge Station sites at Longfellow Creek there may be increased localized levels of metals and pollutants once the Green Line is in operation due to the increased levels of traffic, cars and buses accessing the station. The argument that the overall pollutant levels will decrease is accurate but the local water quality discharge point does not benefit - only the larger downstream receiving water body like Elliott Bay. (Water Section)

The increase in flow out of the culvert that is carrying Longfellow Creek into Duwamish River could negatively impact habitat at the outflow of this culvert; this impact should be analyzed (4-424).

The boundary of the Longfellow Creeks floodplain should be determined and development within the floodplain should be avoided if possible. Columns in the floodplain will have an impact and this impact should be addressed (4-424).

West Seattle Stadium Park

The FEIS should further discuss the nature of an easement and agreement between SMP and the City (Department of Parks & Recreation) that would be required for the monorail facilities proposed to be located over City Park property, including compliance with City Ordinance 111606. The Ordinance requires not only that replacement property "restore the park functions" but that it must be "of equivalent or better size, value, location and usefulness in the vicinity, serving the same community and the same park purposes" (4-306).

The discussion of West Seattle Stadium Park delineates numerous view impacts, however no mitigation is proposed; the FEIS should identify mitigation (4-217).

The DEIS is not persuasive in stating that visual impacts can be completely mitigated by "landscaping, special signage, lighting, and access." If station design has proceeded to a conceptual level prior to the publication of the FEIS, it may be possible for the FEIS to incorporate information from station design that would demonstrate how the mitigation could be effective. The City's Department of Parks and Recreation should have a significant role in this station design process.

Impacts as a result of the removal of forty to fifty mature trees at Avalon 2 should be categorized as "significant" (4-217).

The DEIS analyzes potential impacts to the park largely in terms of park operations and does not thoroughly address the visual affect that the Monorail has on parklands. The DEIS should also discuss the effects to the park "experience" at West Seattle Stadium. (Park & Recreation Section)

Information about the dimensions of stations and guideways—especially heights and widths—is vague. In the case of the Avalon 2 station, the building length of about 240' (as scaled from drawings) appears at odds with the "conservatively high 180 feet" set forth in the "Project Description" section.

Table 4.10-2 does not include a Pro Parks project that is potentially significant to the proposed Green Line because it is directly adjacent to the Avalon 2 station alternative. There are funds available to "improve WS Stadium for a variety of active uses including track and field." The general expectation is that the work would occur in 2005 or 2006. The scope of the improvements have yet to be finalized but would include the area at the west end of the stadium, below the slope along 35th Ave SW. Since the location of the Avalon station is not clearly defined, it is unclear what conflicts might exist between the Pro Parks project and the station. (An outline of all Pro Parks projects can be found at the following URL: http://www.ci.seattle.wa.us/parks/proparks/map.htm) (4-299).

The description of the West Seattle Stadium is incomplete. The purpose and size of the parking lot should be noted. The description should include something similar to the following: "Also on the site is a parking lot that serves both the Stadium and the West Seattle Golf Course and provides spaces for X autos." Similarly, the trees on the western boarder are an important element with respect to character and effect on visual environment. "The site is bordered on the west by 35th Avenue SW but separated from it by a steep slope topped with a screen of mature deciduous and conifer trees. The stand of trees is 30 to 40 feet wide at the north end and about twice that at the Stadium access drive. Because of the terrain and the trees, views to the west are contained and views to the east are open and directed" (4-303).

The DEIS incorrectly identifies the sloped, wooded area at the west end of the West Seattle Stadium site as an area for "passive recreation". This area is actively used as the outfield for a variety of track and field sports including hammer, shot put, javelin, and discus (4-306).

The DEIS says that removal of the tree buffer "could affect the stadium site since the wooded hillside provides a backdrop". Although the nature of this impact is not adequately explained, the Parks department believes that removal of the tree buffer is a "significant impact" by virtue of its effect on the character of the open space and should be identified as such. This is a much more serious impact than the "moderate to high" impact to the Ballard Pool as reported on page 303, last paragraph. By comparison the impact to West Seattle Stadium is clearly "high" and "significant" (4-306).

If the Avalon 2 station is built as planned, the entire stand of trees will be removed and the character of the Stadium are will be dramatically—and negatively—affected. Since this is parkland, visual impacts should probably be measured in broader terms than simply views obstructed. Similarly, recreation is more than operational performance; it carries with it quality of life issues (4-306).

The separation created by this collection of mature trees is a significant factor in the spatial definition and character of the Stadium area. Along with the slopes to the southwest, west, and northwest, the trees define the space and focus it eastward. The distinctiveness of the spatial definition is a strong characteristic of the facility (4-306).

The trees form a backdrop to the field events at the Stadium and contribute a pastoral quality to the athletic setting. Construction of the Monorail will replace the soft, natural boarder of trees on the brow of the hill with a six-story tower flanked by a stark, hard-edged march of columns under a ribbon of concrete. The character of protection and buffer provided by the trees will be replaced by one of exposure and surveillance (4-306).

The principal value of park property, along with recreation, is one of aesthetic experience. Trees and other vegetation contribute to this. Trees, in fact, are an integral element to the concept of park. Although the DEIS reports only 18 to 23 trees to be removed, an informal count indicates that considerably more trees are likely to be removed. A minimum of 45 trees with a dbh greater than 9" appear to be in the path of the project (4-306).

The DEIS overlooks potentially serious operational impacts the Avalon 2 station would have on parking for both the Golf Course and the Stadium. Informal inquiries indicate that, on a typical weekday, currently 30-40 of parked vehicles are hide & ride commuters who have parked inappropriately. Furthermore, observation indicates that parking within 2-3 blocks of the station location are at, or very near 100% occupied on a typical weekday near noon. Presumably, hide and ride parking occurs at the nearest available parking space to the station. Once the Monorail is operational, it is reasonable to assume that most of the available parking capacity of the lot could be filled by commuters by virtue of its proximity to the station. This probable scenario should be reflected in the document, along with proposed mitigation (4-306).

On page 4-96, the DEIS states, "A high potential for park-and-hide parking impacts exists in the West Seattle Segment." The discussion on page 306 should be made consistent with this observation. A further effect might occur as parking demand increases in neighboring residential areas. As in other parts of the city, such increases are very likely to encourage the conversion of unrestricted parking to restricted parking, especially RPZs. This would add further pressure on the stadium parking lot. This possible effect should be reflected in the document. Comments in the transportation section relative to the estimates of hide-and-

ride demand should be reflected in this section as well (4-306).

The DEIS states that effects from the project "could be perceived as a significant unavoidable adverse impact by park users". This statement misrepresents the purpose of the DEIS with respect to assessing the significance of impacts as defined by SEPA (see WAC 197-11-400(2)). Instead, the section should directly say that implementation of the project would case changes that constitute significant unavoidable adverse impacts. The conditional word "could" and the reference to "park users" weaken the assessment of the impacts and should be removed (4-307).

Pigeon Point Greenbelt

The DEIS indicates that "trees and other vegetation would likely have to be removed". The document should indicate the extent—the number or total acres of trees—that would have to be removed. Without such specificity, assessment of the degree of impact cannot be judged (4-305).

Construction staging has the potential for significant impact on open properties near station sites. The DEIS addresses the issue largely in general terms saying that staging would occur principally within station sites but that these may need to be augmented in some cases. While the document lists different staging area options for most other segments of the Green Line, it is unclear about possibilities for the West Seattle Segment. The DEIS identifies the "West side approach to West Seattle Bridge" as "typical of locations that contractors might choose" and mentions, "Only one apparent property suitable for construction staging exists". This issue should be detailed and resolved to assure minimal impacts on Parks facilities in West Seattle (4-487).

A more complete analysis of the impacts of the removal of vegetation at the Pigeon Point Greenbelt on the species that inhabit this area should be completed in order to determine appropriate mitigation (4-458).

Integrating The Monorail

TRANSPORTATION

DEIS Comments

City of Seattle Comments on the Seattle Monorail Green Line Draft Environmental Impact Statement

October 2003

City of Seattle

OVERVIEW

The City's DEIS comments related to transportation emphasize the need to more definitively address transit, bicycle and pedestrian connections through monorail facility design; the need to refine alignments to optimize the balance of street space for freight, transit, bicycles, pedestrians, auto traffic and parking; and the need to more definitively address parking supply and demand impacts, including hide-and-ride parking impacts in neighborhoods.

The SMP interpretation of Council Resolution 30486 concerning mitigation (see pages 4-35, 4-36, 4-88, 4-95) is addressed in a September 16, 2003 letter from Seattle Mayor Greg Nickels to SMP Executive Director Joel Horn. This letter is attached and incorporated into these comments by reference.

TRAFFIC OPERATIONS

The FEIS would benefit from a summary discussion of the operational impacts of center and side-of street alignment alternatives. Because of sight distance requirements, center-of-roadway alignment alternatives will likely require restrictions to left-turns into and out of driveways and result in limited storage lengths for left-turn lanes at intersections. These appear to be unavoidable adverse impacts. Side-of-street alignments show greater potential to be integrated into a roadway design that maintains the essential access and mobility functions of the roadway, but these design solutions may impact on-street parking. Additionally, even optimized side-of-street alignments may impact transit operations, freight mobility, and/or critical turning movements in some areas along the Green Line corridor, and specific mitigation measures should be identified in such instances.

Level of Service and Congestion

The DEIS identifies intersections that will experience significant adverse impacts to level of service with some of the alternatives:

- 15th Ave NW/NW 85th St.
- 15th Ave NW/NW Market St.
- W Dravus St/16th Ave W
- Elliott Ave W/W Mercer Pl
- Denny Way/Broad St
- Denny Way/Second Ave
- Denny Way/Fifth Ave
- California Ave SW/SW Alaska St
- California Ave SW/SW Brandon St
- California Ave SW/Fauntleroy Way SW

The City would like to further review the Synchro calculations of intersection and critical movement level of service and confirm your conclusions prior to publication of the FEIS. For those intersections identified in the FEIS as experiencing a significant adverse impact (Level of Service E or F), SMP should identify specific mitigation measures. The City of Seattle does not recognize LOS E as an acceptable level of service at signalized intersections.

In the DEIS (4-90, 4-91, 4-93, 4-94, 4-97), SMP proposes to fund intersection improvements in a ratio based on the percentage of projected volumes at these intersections resulting from the Green Line. The issue is: does the Green Line worsen traffic conditions at these intersections and what is then required to mitigate this impact? It is not solely the volume that matters, but that fact that the project results in a worsening of conditions. It may be a reasonable approach, however, to negotiate contributions to intersection improvements based on a ratio of impact (rather than volumes). This would

acknowledge that general traffic growth is also contributing to the worsening of conditions, and would give the City some flexibility to prioritize the improvements, combine funds from multiple sources to achieve multiple objectives, and so forth. In a limited number of instances, the City has entered into mitigation agreements in which the project proponent makes a payment to the City which is, effectively, placed in escrow. The City would commit to complete a specified improvement, or a mutually acceptable alternative improvement, within a defined period of time.

In several segments along the monorail alignment, existing street widths do not meet current City standards, which are intended to provide improved safety and more efficient operations. A listing of these street segments should be included in the FEIS if SMP is not proposing to widen the street widths to current standards. The decision to continue to allow sub-standard lane widths is a discretionary decision of the City Traffic Engineer.

In the discussion of mitigation measures common to all segments (4-88), the DEIS states that "the project description anticipates that guideway columns would be placed to avoid potential impacts to vehicle access and circulation to the extent possible…. In locations where property access impacts from column placement cannot be avoided, an alternative access may be provided." This phrasing suggests that alternative access may not be provided. If so, what other mitigation would be pursued? If no mitigation is feasible, such circumstances should be identified as unmitigated (and possibly significant) adverse impacts.

The DEIS sometimes indicates that certain capital improvements are "assumed" in the technical analysis. This seems to indicate that these improvements must be in place for the analysis to be valid; therefore, the improvements should be part of the project description. This is supported by the following statement from Section 4.1.3.1 (Mitigation Measures Included In Project Description and Additional Mitigation Options): "The traffic control features and channelization assumptions that were made for conducting the traffic analysis were assumed to be part of the project description and are described for each segment" (page 4-88). However, the text that follows characterizes these improvements as mitigation that could be implemented to reduce impacts, rather than as an inherent component of the project that would be built. Is it mitigation or project description?

The DEIS suggest that new signals would be provided at the locations listed below. The FEIS should include these project elements in the Project Description or identify them as mitigation, but acknowledge that it will be necessary to meet the technical criteria found in the Manual of Uniform Traffic Control Devices to warrant signalization, and alternative mitigation may be proposed if these locations do not meet the criteria.

The references to these proposed signalized intersections are on pages 4-36, 40, 45, 48, 49 and 75. The locations include:

- 15th Avenue NW/NW 83rd Street
- 15th Avenue NW/NW 63rd Street (this intersection also is identified as 15th/73rd and 15th/53rd - this needs to be clarified.)
- 15th Avenue W/W Armour Street
- Elliott Avenue W/W Lee Street
- SW Avalon Way/SW Genesee Street
- California Avenue SW/SW Brandon Street
- California Avenue SW/SW Findlay Street
- California Avenue SW/SW Juneau Street
- California Avenue SW/SW Raymond Street.

Significant pedestrian volumes are identified for boarding/alighting stations along the Green Line. This will impact the effectiveness of the signal timing. Not specifically noted in the DEIS is the impact to traffic signals caused by increased pedestrian volumes around stations. In

particular, would existing walk times be adequate? Would existing pedestrian-actuated (push button) signals be appropriate? Will existing controllers be capable of accommodating changes to walk time, etc, especially on a time-of-day basis? These impacts should be analyzed. Pedestrian walk-time calculations should be performed for signalized intersections within one block (300' minimum) of stations so that impacts and mitigation can be identified.

Freight Mobility

Truck turns from side streets are difficult to accomplish for medium to larger trucks. Trucks need more time to accelerate into traffic and cross traffic streams. Further analysis should be undertaken to identify problem locations where monorail structures may displace existing truck access. When U-turns and U-turn routes are required for both trucks and automobiles along the Green Line Route and where truck left-turns may become restricted by the project, U-turn routes and U-turns will need to accommodate WB-67 vehicles, without adverse impacts to any residential or local streets. Where Truck-U-Turns and turn movements are expected and impacted mitigation may include; new signals, new left turn signals, new left turn lanes, signing and development of new U-turn Routes for trucks--these U-turn routes may utilized arterials or non-arterial industrial streets (4-44.)

Where driveway or intersection visibility constraints lead to access restrictions the analysis should reflect that there would be additional traffic circulating around the block or through adjacent signalized intersections (4-44). This may add turning traffic at signals or into adjacent neighborhoods that previously would not have experienced this traffic. This would be a secondary impact from the project, associated with changes in driveway or intersection access due to column placement and visibility.

In the DEIS section titled "Truck Circulation", emphasis is given that Truck turns and roadway widths will be maintained (4-44, 4-62), but it should also be disclosed that radii modifications for curb returns and associated relocations may be needed to accomplish some new movements.

The FEIS should describe coordination with railroads and confirm that there will be no disruption to rail spurs, leads, and service tracks. If there are disruptions, describe impacts and what mitigation tools the railroads have recommended.

Transit Operations

The FEIS should identify the impacts on monorail facilities located in the roadway on the design and operation of the arterial system (such as signalization or channelization) and the resultant impacts on transit operations (speed and reliability). The FEIS should identify measures such as: off-street bus transfer facilities incorporated into station sites; in-lane bus stops; bus queue-jump facilities; exclusive transit lanes; and/or transit signal priority to avoid or minimize adverse impacts to transit speed and reliability.

In the DEIS, some station plans show a new curb alignment that pushes the curb into the street, affecting channelization. This type of curb extension is not represented on curbs preceding or following the station area. Without specific channelization drawings, these abrupt changes in channelization cause serious safety concerns. Do not assume curb extensions that are not carried throughout a corridor without specific City design approval.

Throughout the Transportation section, the statement is made that mobility and transit reliability and transit time will improve. Is this referring solely to Monorail service or also to King County Metro transit service? Is it assumed that Metro transit service will increase as a feeder to the Monorail stations and, if so, what would be the impact if this increased service is not realized? Specific proposed changes to Metro bus service are not identified in the DEIS.

The DEIS gives limited information on how transit travel time will be impacted on door-to-door travel (4-26). Sound Transit provided this information for the Central Link project EIS using their patronage model. The TCQSM also offers a LOS measure that compares transit-to-auto travel time, door-to-door. No mention is made of the time needed to get between the first mode and the second mode. Having guidelines in place for short transfers is important.

Traffic Safety: Mid-Block High Accident Locations

Include in the FEIS an analysis of the High Accident Locations at mid-block, as well as the High Accident Locations at intersections listed in the DEIS. The information and listing of these locations will be provided by SDOT to SMP. The 2002 High Collision Mid-Block listing included the following two mid-blocks locations: 15 Ave NW between NW 83 and NW 85 Streets, and 15 Ave NW between NW 85 and 87 Streets.

Traffic Safety: Sight Distance

The DEIS states on numerous occasions that "Columns could be located to minimize impeding side street intersections, driveways, or loading docks, and to provide adequate sight distance around the columns." Since columns are spaced from 80 to 150 feet, it will be very difficult to provide sight distance around columns which are spaced 3 feet off the curb line. This would be even more difficult where columns are located at intersections. Please address how sight distance issues will be addressed when column placement options have been exhausted.

In the Traffic Safety section, the text states that "The Green Line alignment alternatives would result in increases in vehicular, transit, bicycle, and pedestrian activity in the vicinity of the station". The discussion should note that this increased activity likely would lead to a proportional increase in potential traffic conflicts among these modes.

Currently, driveway and property access is not constrained along much of the Green Line Route (4-33). Design for the Green Line must review visibility at all driveways and unsignalized intersections along the route to determine if current movements (into and out from the driveway or intersection) can still be safely managed - the DEIS should refer to AASHTO guidelines for entering sight distance and design should use AASHTO guidelines in it's evaluation and final design. Should the design review identify locations where the guidelines cannot be met, some turning movements may need to be restricted for those locations.

Signal Infrastructure

Much of the traffic signal infrastructure along Green Line seems to be impacted by the SMP structures (columns, footings, guideway). Vertical clearance of the guideway and signal sight lines will need additional analysis during the design phase. The DEIS suggest there will be a need for the SMP to reconstruct many signal systems and/or to provide temporary signalization during construction; these elements of the project should be discussed in the Project Description or as mitigation.

Street and Sidewalk Lighting Infrastructure

Alternatives that occlude existing street lighting or require street light relocations may impact the quality of street and sidewalk lighting--analysis should be provided (such as calculations for ft-candles and uniformity), and mitigation measures (new pedestrian scale and street lighting as needed) should be identified.

TRANSIT, BICYCLE & PEDESTRIAN CONNECTIONS

The Purpose and Need statement should discuss in detail how this project would respond to existing and future demand for transit opportunities and how it accommodates planned regional growth. Other details missing are specific transportation needs in the project corridor, overall transportation goals and objectives, and how the selection of a preferred alignment and station locations are being made through this DEIS process.

To support and promote ridership, it is essential to design for seamless connectivity between the monorail and other modes of transit. The FEIS should include more definitive drawings and descriptions of the project facilities that will result in good intermodal connections at major transit hubs such as King Street Station and Westlake, effective bus transfers at neighborhood stations that anticipate a bus feeder network (notably Crown Hill, Market, Dravus, Delridge, Avalon and Morgan Junction), and pedestrian access to those stations that may present access challenges. At minimum, space to accommodate future improvements necessary to attract and accommodate ridership should be provided at station areas.

Transit Connections

The DEIS assumes that some existing transit routes will be truncated at Green Line stations - suggesting a feeder operation. The FEIS should demonstrate that there are resources available and coordination between SMP and Metro consistent with this assumption, and identify the on- and off-street facilities to be developed as part of the Green Line project that will facilitate this connection. (Most new transit facilities, including the elevated transit system in Vancouver, BC, have built bus transfer facilities to provide seamless transfer connections (examples include Vancouver Skytrain and transit systems in Portland, Salt Lake, Denver, Vancouver, Hiawatha, Houston, and Dallas.) The DEIS does not identify such facilities in the Project Description or in station footprint plans. The FEIS should either demonstrate how the Green Line can accomplish the transfers predicted in the ridership study without such facilities, or incorporate bus transfer facilities in the Project Description.

Implicit in the discussion of performance measures (4-29) is the assumption related to transfer penalties. What assumptions were made related to the transfer penalties between feeder transit and monorail modes?

Bicycle Circulation and Access

Additional consideration should be given to the demand for bicycle parking at downtown stations. While limitations on station footprints may limit or preclude bicycle parking, the issue should be re-examined as design moves forward, as part of the SMP's effort to address the findings of its system-wide bicycle access study. The potential to provide a "bike station" with extensive bicycle parking and supporting facilities at one downtown station that compensates for the inability to provide bicycle parking at other stations should be explored.

The DEIS Access and Circulation sections do not recognize that bicyclists should be considered part of normal traffic. The Bicycle and Pedestrian Facility impact sections for each segment focus solely on bike trails, lanes, and commonly used routes identified in the Seattle Bicycling Guide Map. However, impacts to bicyclists should not be limited to this, since bicycles are entitled to travel on every street in the city, unless specifically prohibited. Even though bicycles are legally considered vehicles, there are differences that result in differential impacts, compared to motor vehicles. For example, because bicycles are much narrower than motor vehicles, and because bicyclists tend to ride as far to the right as possible, column placement can disproportionately affect the visibility of bicyclists by motorists. In other words, the visibility of bicyclists from cars pulling out of driveways and intersecting streets can be more limited compared to the visibility of approaching

motor vehicles. Describe the impacts and a list of possible mitigation tools to be used to offset these impacts.

In the Pedestrian and Bicycle Facilities section, the DEIS does not fully address bicycle access to stations. Many of the stations are located at the intersection of two major arterial streets but within a block of residential streets. Consequently, many bicyclists who do not feel comfortable riding on high volume, busy arterial streets, will use the sidewalk to get from the nearest residential street to the station. This will result in bicycle/pedestrian conflicts as they compete for the same space. Providing appropriate bicycle and pedestrian facilities mitigates this impact. The 1999 AASHTO Guide for the Development of Bicycle Facilities should be used when designing bicycle facilities.

The required sidewalk width is stated as 5' clear width at and 300' from each station entrance (4-35). This is not adequate if the facility in question is going to be shared by both bicyclists and pedestrians. The recommended minimum clear width for a shared use facility is 10', but 12' or 14' might be more appropriate given high pedestrian and vehicle volumes (AASHTO Guide for the Development of Bicycle Facilities, page 36).

The 'Passenger Load" section refers to the accommodation of wheelchair users and passengers with strollers, but no mention is made of passengers with bicycles. The FEIS should describe bicycle loading accommodations or describe the impacts to bicyclist if accommodations are not made and list mitigation tools that may be used to off-set the impacts to bicyclists.

Pedestrian Connections

A more thorough documentation and mapping of transportation facilities in station areas should be developed to identify barriers that exist to pedestrian travel to and from the stations. The existing infrastructure in the area around the station (approximately ¼ mile) will be impacted by the Green Line, with areas closer to stations likely to be impacted more significantly than the areas further away. The monorail stations will create new pedestrian desire lines (desired routes of travel). If obstructions or safety issues exist along these new desire lines, new infrastructure must be added to get people to the station safely. SMP should create a pedestrian circulation plan showing how pedestrians will travel to station entries. Examples of barriers to pedestrian circulation include missing sidewalks and the lack of an appropriately located signalized crosswalk.

The DEIS does not analyze the cumulative impacts to pedestrian and bicycle safety and access as at the stations. The blocks immediately adjacent to the monorail stations will be the area at which many activities converge. Pedestrian level of service calculations based on the Highway Capacity Manual do not take into account shared bicycle and pedestrian traffic and queuing for transit. In the FEIS, the Project Description should incorporate a circulation plan for each station area that:

- Identifies a clear path for pedestrians to access the stations (clear of bicycle parking or transit queuing areas).
- Identifies station entries in relation to this clear pathway and to existing pedestrian infrastructure. For example, locating an entryway near an existing traffic signal rather than at a mid-block location will improve pedestrian safety since fewer pedestrians will cross mid-block. In many if not most cases, this will include multiple access points to the stations.
- Identifies a clear path for bicyclists to access the stations and station bicycle parking facilities. If the facility is going to be shared by both bicyclists and pedestrians, use the 1999 AASHTO Guide for the Development of Bicycle Facilities. Bicycle parking itself should be situated outside of the pedestrian paths and be convenient to the

station entrances without obstructing them.
- Identifies the path by which pedestrians may transfer between monorail and bus transit. This path should work with other planned circulation paths and not leave riders waiting for transit in other established pathways.
- Identifies a clear path for pedestrians walking along the sidewalk but not accessing the station.

Pedestrian connections are discussed in the Land use section in the downtown segment (p 4-150) but are not discussed in segments including urban villages. For consistency, pedestrian connections should also be included in the urban village segments or a rationale provided for having not done so.

The station plans seem to show a level of design and agreement on specific bus zone relocations, layovers, passenger load zones, and station entrances/exits that are very preliminary. Please note in the FEIS that all Station plan assumptions are pre-design assumptions and additional input and agreements with adjacent communities, SDOT, and transit agencies are required before final determination and locations can be determined.

Please clarify the statement about impacts of higher ridership (4.16.2.1), stating that "the private development projects in the Seattle Center/Queen Anne/Belltown, Downtown and West Seattle segments could create a substantial number of residential and office units and could result in impacts from higher ridership."). Is this growth already factored into 2010/2020 ridership projections? (Cumulative Section)

PARKING

Impacts to Parking Demand

The City believes that hide-and-ride parking impacts are inevitable within one-quarter mile of the Ballard segment stations, the Dravus station, and the West Seattle segment stations, unless parking management programs and measures are implemented. The Project Description should include a commitment to parking management programs and measures. The specific programs and measures can be identified later in the project design and approval process, with assistance from the City and input from neighborhood stakeholders. The Project Description should commit to implementation of parking management strategies before stations open, to avoid rather than react to hide-and-ride parking impacts.

The DEIS inaccurately discusses the applicability of residential parking zones. RPZs in Seattle are typically applicable on residential streets of at least five contiguous blocks, 75 percent or higher parking utilization and at least 25 percent attributed to an identifiable parking/traffic generator. If not all of these criteria are met, an RPZ can be established when the Transportation Director determines that a residential parking zone will ameliorate the parking problem and the public interest would be served.

Impacts to Parking Supply

Impacts to the parking supply should be mitigated through measures such as:

- creating new on-street parking nearby by converting unrestricted parking to short-term parking (through installation and enforcement of paid parking technology, time-limit signs, and load zones);
- identifying opportunities for shared off-street short-term parking;
- creating new off-street short-term parking supply as part of a joint development or single-purpose parking facility; and
- supporting development of a transportation management association or marketing programs that provide parking and transportation demand management tools to local businesses in the area to reduce auto travel demand.

Where parking losses are identified, the FEIS should identify the effect of those losses on the parking utilization rate. If this information is provided in the Transportation section, please cross-reference it in the Land Use section. The Transportation section reports supply and demand for on street parking only. To consider the Land Use impacts of changes in parking supply, off-street parking impacts should be identified; a good reference source is the Puget Sound Regional Council, Parking Inventory for the Central Puget Sound Region: 2002, Spring 2002, (on-line at www.psrc.org). The PSRC study boundaries for downtown are Denny to S Royal Brougham Way.

Several of the alternatives give parking ranges depending on whether left-turns/u-turns will be allowed (specifically, Alternatives 1.2-Center, 2.1.1 and 2.1.2). If this is a likely outcome given other City/SMP discussions and the City's decisions, this should be stated as more of a certainty.

Some alternatives identify new on-street parking to be provided. The feasibility of the new on-street parking should be confirmed to the extent possible in the FEIS, based on more detailed analysis of roadway design considerations.

Integrating The Monorail

NEIGHBORHOODS & BUSINESSES

DEIS Comments

City of Seattle Comments on the Seattle Monorail Green Line Draft Environmental Impact Statement

October 2003

City of Seattle

OVERVIEW

The City's DEIS comments related to Displacements and Relocation, Land Use and Neighborhoods, Economics, Visual Quality and Aesthetic Resources, and Noise and Vibration, and Cultural Resources are assembled in this comment section to emphasize the relationships between these different impacts on neighborhoods & businesses.

DISPLACEMENTS & RELOCATION

Impacts & Mitigation

The DEIS states an "apartment vacancy rate of 8.4 percent for Seattle overall." (4-99) In order to more accurately portray the impact on displaced renters the FEIS should state the apartment vacancy rate for the specific submarket in which the displaced units are located. Statement about high vacancy rates does not identify whether the vacancy rate is city-wide, regional, or neighborhood. If the vacancy rate is small within the neighborhood where the relocation takes place, will there be an impact on relocated businesses or residents if they must be relocated to a different area within the city? (also applies to Cumulative Section, p. 465)

The FEIS address relocation issues such as costs to businesses related to relocation planning, search costs, loss of business during the move, a re-establishment period, a working capital loan program, and compensation for comparable tenant improvements.

The identified potential loss of up to 100 residential units is not supportive of adopted plans and policies. The Comprehensive Plan (Housing Element) HG1 states "Accommodate a range of 50,000 to 60,000 additional households over the next 20 years covered by this plan". H9 states "Promote housing preservation, development and housing affordability in coordination with transit plans and in proximity to light rail stations and other transit hubs".

A potential mitigation for the displacement of housing would be for SMP to offer surplus property for the development of housing or mixed-use projects to replace some or all of the units lost through Green Line construction.

LAND USE & NEIGHBORHOODS

Methodology & Analysis

The FEIS must provide analysis of the consistency of the station and operations center alternatives with respect to land use, height, bulk and scale, and the specific development regulations that apply within the relevant area. The City recognizes that additional detail with respect to these issues may be provided as supplemental information with Master Use Permit submittals.

The specific types of direct and indirect land use and neighborhood impacts are listed in the introduction to the Land Use & Neighborhoods section (4-117). However, the segment-specific sections do not provide analysis with respect to list of issues or specific analysis of neighborhood impacts. The FEIS should provide analysis related to these issues, likely drawing on the analysis provided by the SMP urban design and station design program.

The State Environmental Policy Act (SEPA) identifies two separate environmental elements: 25.05.675G (height, bulk and scale) and 25.05.675J (land use). These should be addressed separately within the land use section. Identifying compatibility with uses should be distinguished from compatibility with height, bulk and scale. The DEIS finds that the Green Line is compatible with every area with respect to uses. The FEIS should support this finding with respect to uses, as distinguished from height, bulk and scale. Compatibility with scale can be best explained by first describing the scale of the existing built environment, including both typical height and bulk. Note that the zoned height of an

area is not generally described in the text, but only in tables. It would be helpful to state the zoned height and compare it to the height of the proposed structures. The most accurate description would characterize the scale of the majority of the structures in a given area. If a majority of buildings in an area are high-rise, then it is reasonable to call it a high-rise area. If only one or two buildings are high-rise and the remainder are one-story, then the scale of the area is one-story. However, throughout the descriptive sections of Land Use, areas are characterized without reference to the scale of the majority of buildings, or even a significant minority.

For example, at 4-138, where the Alaska Junction area is described as "transitioning to high- and medium density residential," only one example of a high-rise building is given ("a senior apartment building at the corner of 42nd and Alaska.") Another example of this is Morgan Junction, where representative uses include "mid-rise apartment buildings." In addition, where SMP has used terms such as mid-rise or high-rise, a definition at the beginning and in the glossary would be helpful, such as "high-rise is defined as 10 or more stories"; "mid-rise is defined as between 5 and 10 stories." These issues should be addressed with respect to bulk as well as to scale, comparing the bulk of the Green Line facilities to the bulk of existing structures in an area.

Among the planning objectives developed by SMP is "for support of existing and future land use" (3-10). Has this analysis been done for each station? In the land use section, analysis is based on consistency and lack of conflict with adopted plans and regulations. Is a differentiation possible based on "support land use" that results in differences among alternatives that could inform the decision-maker?

Throughout the DEIS, the statement is made that the project is not incompatible with planned uses. However, in the Project Description section, under Planning Objectives, the stated goal was identified as "supporting existing and future land uses." The FEIS should provide analysis to show how the project supports land uses, as distinguished from not being incompatible with those uses.

In numerous places throughout the Land Use & Neighborhoods section, the statement is made that the "aerial nature of the guideway would not physically isolate the community." This statement does not provide any analysis nor does it address whether the columns or station structures could isolate parts of the neighborhood.

The DEIS concludes that some land use impacts are outweighed by projected transportation and related benefits, but no supporting evidence or examples are provided (4-139). If the conclusions are supported by analysis in other sections, the FEIS should cross-reference the section and page number.

The DEIS states that the Green Line supports policies encouraging land use patterns that support transit (4-156). The FEIS should provide analysis that shows how the Green Line encourages these land use patterns. More information is necessary about how the Green Line's service to urban villages and connections to the downtown core will encourage transit supportive land use patterns as compared to, e.g., encouraging transit-oriented development around Green Line stations.

Impacts & Mitigation

Station footprints were difficult to analyze in terms of functionality, particularly for bicycle and pedestrian access. We recommend both an existing conditions footprint and a station footprint to better see impacts and mitigation. The station footprint plans could incorporate the circulation plan recommended in the Transportation section of the City's comment letter.

Fundamental to the environmental assessment of a project is a clear description of the massing of the proposed development. Maximum station dimensions

for the five typical station types should be provided since precise heights and other dimensions of all stations are not currently known (3-11).

The DEIS does not discuss the potential for the project to cause existing structures and/or lots adjacent to the Green Line to no longer comply with applicable development regulations. Because mitigation for such nonconformities may be necessary, the FEIS should discuss the extent to which such nonconformities will be created (and note that non-conformities would be addressed in greater detail during permitting). Therefore, the FEIS should identify where partial takes may result in nonconformities with respect to development standards such as parking. This is both a land use and economic impact, since nonconformity will prevent expansion of the store and may reduce customer use; please cross-reference accordingly. The FEIS should also cross-reference construction impacts here - will these uses remain viable after a partial take of their parking and a number of months of construction impacts?

With respect to mitigation, the mitigation section at 4.3.3 does not carry forward what appear to be proposed mitigations throughout the rest of the chapter. If those other proposals are mitigations, the FEIS should state so positively and carry them forward to 4.3.3. If they are not proposed mitigation, then the resulting impacts (because there is no mitigation provided) should be listed under impacts of the project. Generally, wherever mitigation is proposed, the FEIS should provide a range of mitigations that can be considered when permit applications are being reviewed. The City's SEPA ordinance suggests possible mitigations in certain areas.

The DEIS states that noise, visual and air quality impacts have been considered with respect to their effect on land use. (4-117) The FEIS should carry forward the analysis of those impacts to the land use section on significant adverse impacts. The FEIS should clarify whether the statement in 4.3.4 that there would be no significant adverse unavoidable impacts assumes that all mitigation proposed in the previous section and other relevant sections has been implemented.

Throughout the section, the argument is made that although there are specific impacts, the benefits outweigh those impacts. For example, see the sentence at the bottom of 139 continuing to the top of 140. The statement is made that there are "no impacts... given the benefits." This methodological approach is flawed. The impacts should be identified separately from any benefits so that the decision-maker can weigh and balance them against each other. While the benefits may outweigh the impacts, that decision should be made after considering all the impacts separately, understanding how they are to be mitigated if mitigation is possible, and only then weighing the remaining impacts against the benefits, if any, promised by the project. The benefits do not make the impacts disappear; and although the benefits may ultimately outweigh the impacts, they need to be identified first so that a balanced judgment can be made.

Specific land use impacts relating to termini stations should be disclosed (4-140, 4-154).

In Section 4.3.4 - Significant Unavoidable Adverse Impacts, does the statement that there would be no significant unavoidable adverse impacts assume that all of the mitigation suggested in the previous section is implemented?

It is unclear from reading the cumulative transportation and cumulative land use sections whether SMP is projecting potential growth in excess of growth projections (4-463/5); this should be clarified in the FEIS.

ECONOMICS

Business Impacts and Mitigation

The section does not fully address the impacts of construction on affected businesses. The FEIS should include a

section on construction mitigation for businesses. Another impact not sufficiently addressed is the construction impacts on freight mobility. Construction of the project would most likely adversely impact the connection between the Greater Duwamish and Ballard-Interbay-North End manufacturing and industrial centers.

There will likely be a during- and post-construction impact on ingress and egress to businesses along the alignment. This is pronounced in the industrial and manufacturing areas that the monorail will bisect. Truck maneuverability and turning radii need to be maintained both pre- and post- construction to keep the freight community functioning.

The station descriptions in Chapter 3 make no mention of the potential for new businesses in stations and the affect on other neighboring businesses. Given the footprint of stations (in Appendix L of the DEIS) there would appear to be space for street-level businesses at many of that stations. Is rental/lease space going to be made available at some or all stations? If so, what would be the impacts on neighboring businesses (4-168)?

Government Impacts and Mitigation

Revenues to Local and State Governments. Revenue losses from removed parking meters should be identified in the FEIS. Examples include revenues from meters along 5th Ave N, 5th Ave, Stewart St, 2nd Avenue. For instance, in 2002, parking meters in this area generated $590 per meter per year along 5th Ave N and $1280 per meter per year along 5th Ave. In 2002, parking meters in the Downtown segment raised about $1,250 per meter per year (4-162). However, if parking mitigation measures along the Green Line are implemented and include the installation of new paid parking technology, these can also be identified and considered in the net impact to revenues in the FEIS.

VISUAL QUALITY & AESTHETIC RESOURCES

Methodology

The DEIS indicates that FHWA visual impact methodology was employed in the analysis of Green Line impacts (4-170). However, the application of the methodology is not evident in the document. At minimum, visual impacts should be individually assessed in terms of Visual Quality, Viewer Response, and Visual Character before an assessment can be made of the significance of an impact.

Where visual simulations are used to depict shade and shadow impacts, the shade and shadow impacts of the guideway, columns and stations do not appear to be fully captured; the FEIS should provide additional detail. (Appendix M – Visual Simulations)

Visual Quality and Historic Resources

The loss of historically significant buildings through demolition should be treated as an impact with adverse effect. Loss of the building fabric alters the contextual setting, streetscape, and interpretation of adjacent historically significant buildings, and in the long-term diminishes the historic character of a particular area through loss of building fabric.

The impact to historic resources is not limited to Pioneer Square, the Visual Quality section of the FEIS should identify other areas of impact rather than referring the reader to the Cultural Resources section (4-218).

Streetscape

In discussing mitigation measures, in section 4.5.3.1, it is not clear why this section is labeled "Operation," as it describes design alternatives that could mitigate impacts. This section briefly addresses some of the architecture, urban design and landscape principles and criteria that have been more fully developed by SMP and should be more

extensively and definitively incorporated into the FEIS (such as replacing "could" statements with "would" or by incorporating these design principles and criteria into the project description).

Additional potential mitigation that should be described in this section includes: integration of street signage, street lighting, traffic signals and other above grade utilities into monorail columns and stations; integration of bus shelters, newspaper vending, pedestrian lighting, waste receptacles, and wayfinding signage into monorail columns and stations; and undergrounding of overhead utilities.

The removal of street trees could be a significant unavoidable adverse impact in several segments of the alignment where street trees are mature and comprise a significant feature of the neighborhood setting (4-218/219).

The visual simulations in Appendix M show only the trees removed that would be in the footprint of the guideway. Construction may require that more trees and landscaping are removed or destroyed than is depicted in the photos. In this respect, the photos may be misleading.

The DEIS mentions that glare from reflective surfaces on trains or stations "could be mitigated by using low-reflectivity materials or screening, using low-intensity down-cast lighting" (4-207). Similarly, the DEIS discusses mitigation through spacing of columns (4-217). Yet, there is no mention of these possible measures in the mitigation section of the Visual assessment (4.5.3). The mitigation section should reflect this proposed mitigation.

NOISE & VIBRATION

Vibration – Methodology & Analysis

The vibration impact analysis of section 4.7 omits an assessment of vibration-induced noise. Where sensitive receptors are adjacent to the guideway, the FTA Transit Noise and Vibration Assessment guidelines (abbreviated as FTA Report 1995 in the following review comments) may not provide adequate means of addressing this issue. Both McCaw Hall and Benaroya Hall are extremely sensitive to low frequency noise generated by ground-borne vibration. Recordings made in these facilities require very low noise environments, less than NC 15 to NC 20. Benaroya Hall is isolated from ground vibration originating from the rail tunnel beneath it. However, the propagation path for surface and near surface vibrational waves may affect the structure of both halls, and Seattle Center theaters, in an anomalous manner. A more detailed assessment method is required. The discussion on page 4-257 should be amended to include the potential risks of this noise source and the need to analyze the issue further during final design.

Ground propagation tests are commonly required for transit projects, and recently were conducted for Sound Transit's Link light rail and Dallas Area Rapid Transit (Texas). Vibration propagation measurements for Sound Transit characterized the vibration characteristics of subsurface material at selected sensitive locations. The resulting propagation curve (known as the mobility transfer function) is combined with the known characteristics of the light rail vehicle and its track bed to predict future vibration levels at locations along the project corridor. As the project proceeds into design and permitting, equivalent studies will be needed to properly represent vibration risks at the most sensitive sites along the monorail route and provide appropriate mitigation.

Because of the variability of ground propagation characteristics, and the unknown frequency-dependent nature of ground propagation at these sites, the only reliable means of determining the risk of vibration-induced noise are either a) site-specific test, utilizing a known force transducer driving the ground at a setback and depth comparable to the foundation locations for the monorail columns, or b) a determination of the spectral force density and transfer mobility curves. Refer to FTA

report, sections 11.2 and 11.3, for a description of this methodology and its validity.

Option a) or b) are required to adequately determine the risk of vibration impacts. Implementing Option b), Sound Transit has conducted a series of transfer mobility measurements, at receiving point's on-grade and in structures above grade, to determine site-specific ground propagation characteristics, which vary naturally from one site to another, depending on subsurface soil and geologic features. Such tests should be conducted adjacent to the most sensitive facilities bordering column foundations for the Green Line alignment. The force density of the monorail is not known, and should be measured as well, either along the Seattle Center line, or at the Bombardier Mark VI monorail in Orlando, Florida. The combined results of the transfer mobility data, at specific future support column sites, and Seattle or Orlando monorail force density data, permits a reliable prediction of the vibration spectrum.

A valid prediction of the ground vibration spectrum is required to assess the risk of excessive low frequency vibration and low frequency noise at sensitive receivers (Seattle Center, and Benaroya Hall). The DEIS analysis of vibration uses other means of determining vibration propagation, namely a simplified estimate derived from standard (averaged) distance propagation curves, as contained in the FTA Report. This method of determining expected vibration levels is open to the risk of underestimating the expected vibration. A new vibration assessment, using option a) or b) should be provided. Specific review comments of the simplified estimating method are provided, below, to indicate where errors and uncertainties lie in the application of this simplified method. Only if there is clearly no risk of vibration impact to a specific receiver would the averaged propagation method be considered adequate.

Measurement of horizontal ground vibration motion has not been provided. Measurements should be made to demonstrate whether this vibration is comparable to the vertical motion, or not.

Vibration events have impacts in two dimensions: the strength of the event, and its frequency of occurrence. If vibration events are widely spaced in time (infrequent), the project's affects on adjacent structures and occupants is lower. No occurrence rate analysis has been provided. The SMP website notes that "Trains will run every 4-5 minutes at peak hours, 8-10 minutes off-peak; could add trains to run every 2 minutes." An analysis of vibration energy events, based on numbers of wheel axles per train and expansion joint spacing, should be included in the EIS, and should use the system's potential peak hour train frequency (2 per minute), or 1 per minute in both directions, to develop an impact assessment of the frequency of occurrence of vibration events. See the FTA Noise and Vibration Report, pp. 8-1 to 8-5 for guidance in assessing frequency of event impacts.

Section 4.7.1.5, paragraph 1: The FTA Report is a major guideline document, but is not the sole reference for criteria to judge environmental impacts, as required by NEPA, SEPA, and subsequent regulations. This is especially so for vibration impacts to sensitive receivers, such as research facilities, biotechnology campuses with microscopes, microchip manufacturing, surgery suites in hospitals, and low-noise environments of recording studios, concert halls, and theaters for drama. The DEIS should be revised to include the incorporation of the full environmental standards for vibration as accepted in standard architectural design practice for the vibration sensitive building types listed above.

In Section 4.7.1.5, paragraph 3: At the end of the paragraph, it is noted as follows: "The vibration propagates from the foundation throughout the remainder of adjacent building structures." The remainder is

presumable the upper floors. This should be clarified in the FEIS. Furthermore, the DEIS not mention that vibration may cause resonant responses in upper floors of adjacent structures, increasing vibration levels by up to 10 dB at low frequencies (FTA Report). This risk for sensitive receivers should be assessed in the DEIS.

Vibration Criteria for Special Buildings: The criteria cited under this heading are general in nature, and are useful in the screening process to identify potentially affected structures. It is not sufficient for determining the risk of excessive vibration or vibration-induced noise. This should be stated in the text of the DEIS (4-237).

Section 4.7.1.6, paragraph 2: Damping is usually limited to internal damping as the vibration propagates in rock and soil. The "high degree of vibration damping" cited for the guideway supports and foundations is not substantiated with supporting data in section 4.7 nor in Appendix R. The claim of a high degree of vibration energy loss should be justified, or removed. Damping as a technical term should not be used except for internal soil losses, unless further explained.

In Section 4.7.1.6 (third paragraph), the DEIS claims that the older Seattle Center monorail produces more vibration than would the future SMP vehicles; supporting documentation should be included in the FEIS.

In Section 4.7.1.7 (first paragraph), the claim that the train's suspension systems will reduce vibration is questionable. The newer suspension systems may increase vibration at the ground. Suspension systems can increase the vibration levels at speeds above 25 km/h (15 mph), as reported by Hunaidi and Tremblay (1997), Canadian J of Civil Eng, 24: 736-753. Hunaidi and Tremblay found that transit bus suspensions, designed for human comfort over bumps, typically double the velocity amplitude of ground vibrations, and upper floors of structures responded at higher vibration levels than the foundations.

In Section 4.7.1.8 (third paragraph), the DEIS claims the Green Line guideway would be smoother than the existing Seattle Center Monorail Guideway; this also should be supported by documentation in the FEIS.

The lateral foundation loads should be considered on adjacent utilities (4.16.2.7).

The FEIS should consider dynamic (vibratory) foundations loadings due to train operation over time. Close utilities could be impacted from vibration induced settlement (4.16.2.7).

Vibration – Impacts & Mitigation

In Section 4.7.1.8, the concluding sentence claiming lower vibration levels at almost all locations and times is premature given the above comments and concerns.

Section 4.7.2.3 should also include the impact to sensitive utilities not just buildings. The FEIS should consider dynamic (vibratory) foundation loading due to train operation. Nearby utilities could be impacted from vibration induced settlement.

Section 4.7.2.3 should also include the impact to cast iron water mains with lead joints; they can be very sensitive to disturbances as described in City of Seattle Standard plan section 1-07.16(1).

Noise – Methodology & Analysis

The operation of the monorail must meet the Seattle Noise Ordinance objective standards stated in section 25.08.410.

The noise analysis must include air brake noise when train is in operation; areas of concern are stations and areas where the train reduces speed.

In Section 4.7.1.6 and 4.7.1.7 the FEIS should provide further evidence to support the claim that the new expansion gaps will be smoother. Fewer expansion joints in a given length of guideway usually means larger gap sizes at each joint to

accommodate greater movement, not smaller gaps, as implied. In addition, longer spacing of expansion joints is more susceptible to vertical misalignment, due to differential foundation settlement. A discussion of this risk should also be included in the FEIS.

Noise – Impacts & Mitigation

The statement that "residential location with an existing 40 dBA Ldn would not be considered affected unless project noise would be 15 dBA or more higher than existing" needs clarification as to why a 10-15 dBA increase is not a significant increase. This is a more than doubling of noise levels to a quiet environment (4-230).

In Section 4.7.3.1, shielding is discussed. The FEIS should identify where will the shielding be placed; for example, on the train, along the rail, at the stations, on the residences.

In section 4.7.3.1, there is a statement about special mitigation measures. The FEIS should identify when this will happen if needed, for example, before construction, after construction or after train is in operation.

It is unclear from the DEIS if SMP is committing to implement effective noise mitigation measures. Given that all of the significant adverse impacts are to residential properties, it would seem likely that mitigation is required (4-275 and 4-276).

CULTURAL RESOURCES

Within the Cultural Resources chapter and Appendix N drafts there are discrepancies between information and findings conveyed in the charts and tables, and the narrative body, omissions and only partial summaries in the narrative body of material contained within the tables and charts, and conflicts between the information presented in the tables, charts and narrative body and the conclusions reached regarding levels of effect, impact, and resource significance.

Methodology & Analysis

The FEIS should clarify in references throughout Section 4.11.2 (Methodology: Historical Resources) that the review for City of Seattle Landmark eligibility was conducted only for properties to be demolished; Appendix N makes it clear that City of Seattle Landmark eligibility review was conducted only for properties to be demolished.

Impacts & Mitigation

The DEIS states that secondary impacts from other environmental areas (i.e. visual, noise and vibration) will not adversely effect historic resources (4-325); however, these secondary impacts are not defined in the other sections or in Appendix N. These secondary impacts should be defined, particularly in the noise and vibration section where non-specific engineering information regarding the physical scale and operation of the system suggest that proximity and tolerances between fragile architectural features may become an issue as more project design details emerge.

Construction monitoring in additional locations beyond those categorized "high probability" is recommended. A randomly chosen, statistically defensible sample of those areas with a lesser probability of bearing significant historic or prehistoric deposits (but still viable, based on local depositional history), would allow for both resource protection and future methodological assessment. Sub-surface resources warrant added vigilance based on their extreme vulnerability during construction and the difficulties in planning and protection for this resource type. Given the current plan where only high probability areas are monitored (i.e. provided only the minimum level of protection), if resources are found and data recovered, they will add to what we know in areas where some historic or documented information is probably already available. If significant resources come to light in other areas impacted by the Green Line, new information will be gained for less well

documented land use, and the predictions possible for future work will be further refined. Practice has shown that isolated finds of certain types can be highly significant, and significant findings are frequently encountered in unexpected places.

The DEIS states loss of access, change of function, and neglect would not result in long-term adverse effect due to the location of the properties in a highly urbanized area (4-334). This loss of access would be critical, particularly if construction of the Green Line coincides with the Viaduct, or in areas with concentrated historical resources such as Pioneer Square. The loss of economic viability due to an unmitigated construction process would increase the potential for historic building resale for development purposes and the buildings' ultimate demolition in favor of new construction deemed more economically viable for the location. Construction interrupts and strains the tenuous hold on economic sustainability maintained by historical resource property owners in highly urban areas where competition for development of limited land is strong.

There would be a significant unavoidable effect to the visual character of downtown streetscape, historical resources along the Green Line (4.11.5.2).

Specific mitigation measures are not well developed or affirmatively stated, while the model for predicting where significant resources are most probable is excellent (4-341). Construction monitoring constitutes only a first step as a mitigation measure. It simply locates those locations where immediate further mitigation may be necessary. The development of additional planning measures, including a Programmatic Agreement, monitoring plan, and detailed treatment plan as noted in section 4.11.5.1, are critical to the FEIS.

Supplemental Treatment Plans should include a plan for wet site data recovery, since specialized techniques and equipment are required. Additionally, since fill areas carry a higher probability of hazardous materials, supplemental plans should also include a plan for coordination with Hazardous Materials specialists for the identification of locations with known hazards and testing for hazardous materials should data recovery become necessary. Training requirements for workers should also be outlined, and staff prepared in advance for this eventuality.

With regard to mitigation, remediation measures such as cleaning and repointing of masonry, assessment of glazing and window frame conditions and restoration of architectural detailing along the upper levels of historic buildings immediately adjoining guideway would be appropriate measures given the effect the construction will have on adjacent buildings.

Specific mitigation discussed among SMP and its consultants, the Washington State Historic Preservation Officer and the City of Seattle Historic Preservation Officer were not limited to the measures discussed in the DEIS and the Memorandum of Agreement should not be limited to those measures referenced in the DEIS (4-341-344).

In discussing demolition, the FEIS should be more definitive about impacts. For example, the sentence reading "Some of the alternatives could result in the demolition of historic resources" (4-341) should read "Some of the alternatives will result in the demolition of historic resources."

Integrating The Monorail

NATURAL ENVIRONMENT

DEIS Comments

City of Seattle Comments on the Seattle Monorail Green Line Draft Environmental Impact Statement

October 2003

City of Seattle

OVERVIEW

The City's DEIS comments related to Air Quality, Energy, Environmental Health, Earth, Water and Plants & Animals are assembled in this comment section to emphasize the relationships between these different impacts on the natural environment. (Most comments related to Parks & Recreation that inform impacts on the natural environment are included in the West Seattle and Uptown/Seattle Center/Belltown sections of the City's comment letter.)

AIR QUALITY

Methodology & Analysis

Maintenance and service vehicles used by SMP for the Green Line are not discussed in terms of number of types of vehicles, source of propulsion; this should be added to the discussion (4-224 – Air Quality Section).

Impacts & Mitigation

Traffic patterns and pedestrian accesses will be modified due to the project implementation, placing additional environmental hazards, especially air pollution, into additional neighborhoods previously less active, the Air Quality section does not discuss this potential impact.

ENERGY

The DEIS states that "Seattle City Light has indicated that the estimated power demand for the Green Line would not cause adverse impacts to the local power supply" and "Power demand for Green Line operation would not significantly affect City Light's regional capacity, although upgrades to some transmission lines and power substations may be required" (4-279, 4-296). Slightly different wording is suggested in both sections regarding power supply to convey that the project would not have a major impact on energy resources available to SCL, however upgrading some transmission lines and power substations may be required to deliver electrical power to where it is needed. So we suggest removing the phrases "local power supply" and "regional capacity" and replacing them with: sources of electrical energy available to SCL.

The DEIS states that "It is anticipated that the train propulsion system substations will be supplied by common feeders from one or two City Light sources. The number of sources needed will depend on Seattle City Light's infrastructure at the time the power is needed for the Green Line." "Each passenger station and the Operations Center will be powered by separate electrical service connections." (4-280) Does SMP request power for each passenger station (19) the Operations Center individually; or is the SMP planning to serve them from the traction power substations (10 to 20)? Please note SCL has not yet agreed to a service design or supply points. Further work is needed to determine the best service plan to avoid wasted capacity on dedicated feeders.

ENVIRONMENTAL HEALTH

Methodology & Analysis

The DEIS states that "There is no conclusive evidence showing a link between EMF and the type and level associated with monorail and other types of transit and adverse human health effects" (4-367). The FEIS should provide supporting analysis or references, as the reference in the DEIS did not support the conclusion as it pertains to pacemakers and implanted medical devices. As noted in Appendix S, some health guidelines contain fairly restrictive limits on electric and magnetic field exposure for persons with pacemakers.

Impacts & Mitigation

The Environmental Health section fails to acknowledge that discoveries may also lead to rerouting of essential utilities to nearby locations where environmental conditions

may again be uncertain or discovered to require additional effort to rectify.

To avoid significant adverse impacts, the FEIS should commit to standard operating procedures, health and safety plans and the like that are discussed in Sections 4.12.5.1 and .2 (4-366/7).

While Appendix S leaves open the possibility of adverse health effect from EMF's, and contains mitigation, Section 4.12.7 does not include a statement on mitigation. The statement in this section that "Once a system is chosen, electric and magnetic field intensities will be confirmed and compliance with applicable standards will be ensured" is not worded as mitigation for potential impacts, nor are the "standards" mandatory. Unless further analysis can justify a conclusion there are no potential impacts on health, the City recommend that mitigation be stated in this section as follows: "The DBOM contract will include engineering assessment during design to ensure compliance with ACGIH and ICNIRP guidelines for exposure to electric and magnetic fields, and testing and monitoring to demonstrate compliance prior to and during operation."

EARTH

Impacts & Mitigation

In section 4.13.3, a subsection should be included for prevention of accumulation of explosive levels of methane gas in enclosed spaces (4-385).

In section 4.13.3, the DEIS does not provide substantive discussion of earthquake processes and their impact on the Green Line (4-386).

The DEIS also does not address mitigation to prevent damage, especially catastrophic failure, of facilities of the Green Line, resulting from possible high level of seismic shaking. The high bridges would be particularly at risk from seismic shaking, as would linear elevated structures supported by periodic supports. The FEIS should include discussion of levels of earthquake magnitude for design threshold criteria, and include relationship between these earthquake levels as they relate to the design of the facilities of the Green Line. It should also discuss any mitigation to prevent damage to monorail facilities as a result of seismic shaking.

The FEIS should acknowledge that the project must meet current seismic design criteria. Concerning landslides, local building and grading code regulations require that projects not increase the potential for earth movement, and that the risk of damage to the development from instability be minimal. Therefore, this project is required to be designed such operation of the Green Line will not adversely impact earth as it relates to landslides.

WATER

Methodology & Analysis

The DEIS often states that the Green Line will have beneficial impacts to water quality but does not back it up with modeling data specific to the pollutant(s) in question. The DEIS also often states that the Green Line will not have significant impacts to the potential for CSO overflows but does not back it up with any modeling data; the FEIS should provide more information.

In section 4.14.3.2, reference is made to the inclusion of typical pollutant concentrations of roadway runoff to link the change in PGIS to estimated quantities of pollutants that could be expected. The DEIS does not demonstrate what those estimated quantities were the FEIS should provide more information.

The Green Line will produce tire and brake wear and possibly hydraulic fluids, industrial activities at the operations center and increased traffic near the stations, not just stormwater runoff (4-391). The DEIS does not support the statement that the Green Line may have a beneficial impact on water quality.

During permitting, a Comprehensive Drainage Review, per City's Director's Rule, will be required with additional information which is required for large projects, defined as projects that include 1 acre of land disturbing activities or the cumulative addition of 5,000 square feet or more of new and replaced impervious surface (4-390 & 4-391). The City must review and approve the design assumptions used to calculate the required storm water detention volume. These include the area of pervious and impervious surfaces, time of concentration, coefficient of run-off, and orifice' size. If it is not practical to include this information on the plan then a separate drainage control report should be provided.

The DEIS assumes that increased stormwater quantity is not detrimental to designated receiving water bodies (4-391). Water quantity can affect in-stream turbidity and erosion. An analysis of the impacts of the increase in volume to designated receiving water bodies is required and mitigation of these impacts will be required.

Water quality and quantity impacts of the project should not only be measured by the increase of impervious surface (4-391). Changes in operation or use and change in grade of the site also affects water quantity/quality.

Table 4.14-8 shows that all station alternatives will reduce pollution generating impervious surfaces (4-409). However, it is unclear if the analysis included the increased likelihood of a future overall increase of PGIS associated with future on-street support facilities (e.g., bus layover facilities) for the stations.

The guideways and trains will contribute pollution (copper, tin, zinc iron, chromium, hydrocarbons and grease) directly and indirectly to the Duwamish River, Elliot Bay, the Lake Washington Ship Canal, Lake Washington and Lake Union. These heavy metals and petroleum bases substances are toxic to the aquatic environment. The assumption that the quantities of these pollutants that will be added to the ecosystem are less than what Metro buses contribute is not the correct way to analyze the impact (4-411, 4-414, 4-419). The FEIS should acknowledge that the operation of the monorail will generate pollution and add to the stormwater system and to Duwamish River and the Lake Washington Ship Canal from the bridge crossings, and the FEIS should suggest possible mitigation options to eliminate these toxins from entering the aquatic environment.

Impacts & Mitigation

The City of Seattle has local jurisdiction over the project; therefore, the City's Stormwater Management regulations Chapter 22.800 Stormwater, Grading and Drainage Control Code and Director's Rules that accompany this code should be evaluated and described in as much detail as the Federal and State regulations. (Specific references related to the application of the City requirements are provided in the Miscellaneous section of the City's comment letter.) The Green Line will be considered one project and meet the definition of a large projects.

The City's SEPA policies suggest that flow mitigation for designated receiving water bodies will be required to mitigate impacts caused by an increase in velocity.

Any continuous discharge is limited to the specified flow rates and on-site detention and flow control devices provided to regulate peak runoffs from new impervious area per Stormwater Grading and Drainage Code. No discharge shall be permitted during heavy rainfall.

Impacts should be identified more definitively, and mitigation should be identified affirmatively (particularly when it will be necessary to meet City code requirements). Detailed references are provided in the Miscellaneous section of this comment letter.

A sample monitoring plan should be included in the FEIS.

PLANTS & ANIMALS

Methodology & Analysis

Street trees should be analyzed in this section because they are plants and they provide habitat for birds (4-440, 4-454).

The DEIS should provide analysis of the affects of lighting on birds and wildlife (4-454).

No information is provided on the size of the structures that are proposed for the Ship Canal; therefore, no analysis can be made on the increase in the amount of predation that may occur because of these structures.

Ship Canal Crossing

The DEIS states that "The structures (across the Ship Canal) will provide more habitat for bass; therefore this may increase the bass population if this habitat is limiting." Without knowing what the limiting factors are for bass in this system, this sentence may not be accurate. The FEIS should provide additional information (4-455).

Impacts & Mitigation

Impacts should be identified more definitively, and mitigation should be identified affirmatively (particularly when it will be necessary to meet City code requirements). Detailed references are provided in the Miscellaneous section of this comment letter.

The DEIS mentions that in-water impacts could be avoided by "spanning the Ship Canal" (4-457). Is this option analyzed in any detail in the DEIS? If not, the FEIS should either analyze the option, identify it as a mitigation measure, or remove the statement about avoiding impacts.

Integrating The Monorail

UTILITIES & CONSTRUCION

DEIS Comments

City of Seattle Comments on the Seattle Monorail Green Line Draft Environmental Impact Statement

October 2003

City of Seattle

OVERVIEW

The City's comments related to Public Services & Utilities and Construction are assembled in this comment section to emphasize the relationships between these different impacts. Utility relocation necessitated by the project is complex and has significant potential for adverse impacts to customers as well as generating construction impacts. A comprehensive, coordinated construction management plan will be essential to minimizing impacts associated with construction.

PUBLIC SERVICES & UTILITIES

Public Services—Crime Prevention

The FEIS should describe SMP's plans for the following three public safety and litter problems: graffiti removal from structures and pillars; accumulation of litter and debris around stations; and facility safety. The SMP is pursuing Crime Prevention through Environmental Design; project elements and operations consistent with these principles should be identified in the FEIS.

Public Services—Propane Storage Hazard

There are two cases in which the guideway will potentially be in close proximity to designated propane storage depots. At Seattle Center the propane storage is located near the NW corner of the Memorial Stadium property at the top of a steep embankment and adjacent to the access road. In this case, the guideway would appear to be what the Seattle Fire Department considers too close to the storage location. There is also a potential conflict just south of the proposed Weller Station where the alignment runs on the east side of Seahawk Stadium. The propane storage is located just south of the cooling tower building. The guideway would appear to run directly over the top of the storage, again this would be unacceptable. Both of the locations described above were identified after protracted negotiations between the Fire Marshal and the facilities. Both facilities are high-capacity public assembly venues where the outdoor storage locations are critical given the relatively large aggregate quantities of up to 500 gallons of propane. Relocation of the storage may not be option. Mitigation measures that would not require relocation, such as blast protection enclosures, are being researched by the Fire Marshal's Office (4-292).

Utilities—Guideway and Operational Impacts

The FEIS should acknowledge the need to develop a consolidated utility relocation plan that includes locations of relocated utilities, the sequence and schedule of utilities to be relocated, a description of service disruptions, and the like. The DEIS described the list of utilities for which each alignment necessitates relocation as a "utility relocation plan" (4-290). The FEIS should either be informed by sufficient preliminary engineering to include the ripple effect of secondary utility relocations, or note that additional relocations may be identified in a consolidated utility relocation plan.

The train power systems could introduce unwanted noise and harmonics into the SCL power system. The FEIS should identify mitigation, such as a DBOM contract provision for power-conditioning equipment that meets SCL standards.

Maintenance of utilities near guideway foundations presents problems. With the existing monorail, maintenance is frequently complicated by the need for special (expensive) shoring requiring review by utility owner and sometimes monorail personnel. One possible way to mitigate this would be to design the new monorail foundation in a way that open excavations of the nearby utilities will not compromise the structural integrity of the foundations. If this is not addressed in design, the City would consider this a long-term adverse impact on our utilities near the foundations

and would seek greater clearances (requiring more relocation) (4-466, 4-296).

Without mitigation, electrical equipment may be affected by stray current and unwanted noise and harmonics; not all stray current will current will be eliminated by induction of the DC current. In addition, adverse impacts on electric utility service could occur. Cathodic protection devices within the structures and piers/foundations will protect the structures but not the underground utilities (4-295/6/7). In addition, adverse impacts on electrical utility service could occur. The FEIS should clarify statements concerning these impacts and mitigation. An acceptable mitigation measure would be to conduct an analysis of whether stray current from the direct current guideway power rail will accelerate the corrosion of underground utilities. This analysis would be provided to the City for review and approval, and specific mitigation measures developed to mitigate such potential before project construction approvals are granted by the City.

CONSTRUCTION

Utility Relocation—Roles and Responsibilities

The FEIS should note that the City-SMP Agreement for Intergovernmental Cooperation for Green Line Development assigns financial responsibility for the relocation of City utilities necessitated by the project to SMP.

The Construction section or Project Description should note that the City's Pavement Opening Policy establishes the zone of influence for reconstruction of street infrastructure after demolition associated with Green Line utility relocation and facility construction.

Utility Relocation—Schedule Considerations

The DEIS states that "Green Line construction is expected to begin in 2005 and continue into 2009 (4-470). The construction schedule should acknowledge and include the time it will take to complete the relocation of all utilities. For example, SCL estimates relocation of underground electrical equipment along the west side of Second Avenue will be a multi-year project. Transmission relocations may take more than 6 weeks to construct depending on the number of structures that need to be moved. SO-MV 230 kV may be an example of this kind of impact at Colorado and Hanford St. Recent similar projects have taken up to 3 months. This is not reflected in the schedule, or in the assessment of construction impacts. A prolonged construction period increases construction and other impacts relative to the additional areas (outside the Green Line route) affected and the intensity of the construction activity (4-472).

The DEIS states that "rather than relocating utilities that are adjacent to guideway foundation, with the approval of the utility company, pipe or duct banks could be protected or reinforced rather than relocated" (4-473). Along the downtown corridor, especially 2nd Avenue, further detailing for proximity of the guideway foundation to existing utilities is necessary.

There could be a timing problem to moving, temporarily or permanently, Seattle City Light overhead or underground lines at certain times of the year (4-473). This would be especially true in winter, when SCL experiences peak loading. SCL may not be able de-energize lines because there could be no alternative way to route power during heavy loading. This depends on the Seattle City Light system configuration at the time, and the configuration changes from time to time.

Access to utilities must be maintained during construction, for repair or maintenance of City utilities (4-491, 4-517).

Long range planning is required to determine and mitigate utility impacts. This requires coordination with the City to develop a plan for design and sequencing of the relocation of all utilities. Specific

impacts to customers along the route must be determined during the planning stage as specific plans are developed. The City will coordinate shutdowns with customers and determining if temporary services are required; therefore, the construction sequencing must be determined and integrated into the design phase, with extensive coordination between SMP, its contractor, the Seattle Fire Department, Seattle Public Utilities, Seattle City Light, and Seattle Department of Transportation (4-512).

The FEIS should clearly state that there are significant adverse impacts resulting from proposed utility relocations, particularly those along Second Avenue. Additionally, the FEIS should identify new locations that are being considered for electrical equipment and other utilities that would need to be relocated, and an assessment of construction impacts should include construction required in the new utility locations (4-513). Finally, the FEIS should make clear distinctions between the alternatives with respect to utility relocation and construction impacts; no such comparisons are provided in the DEIS (4-517).

Construction Mitigation Plans

Construction mitigation plans should have more details. Procedures to minimize negative impacts should be listed for three stages: Site Preparation, Construction, and Post Construction. Additional details on mitigation such as Best Management Practices (BMP) used during construction should be included, such as covering truck beds when hauling, limiting delivery paths, minimizing unnecessary vehicular and machinery activities, etc.

Construction-Related Vibration Impacts

The FEIS should provide more complete information about the potential impacts of construction-related vibration; specific references are provided in the Miscellaneous section of the City's comment letter.

Construction Staging

In Section 4.17.1.6: Construction Staging, there is no mitigation plan for such an extensive area for protection, access and dead load weight impact on shallow underground utilities that maybe in these areas (4-480/481). Also, there is no discussion of water quality impact due to construction activities. Staging layout plans must ensure that appropriate clearance to overhead electrical lines is maintained (4-480). Construction impacts involving acquisition of parcels should also be reflected in Displacement, Economics and Land Use sections. Issues to be considered include: will there be staging areas outside the industrial zones to be near the station construction at, for instance, the termini stations? Are there sufficient vacant parcels near the alternative Operations sites to accommodate staging or will active businesses be affected? Is it possible that in the Interbay Operations site alternative, commercially zoned property could be affected? Would acquisition affect general parking availability in either area or affect required accessory parking for businesses, creating nonconformities?

The use of a concrete batch plant in one of the staging areas creates possible impacts to nearby streams (4-481). The discharge of non-stormwater to the City's stormwater conveyance system is permissible via both the City's Stormwater, Grading and Drainage Control Code and the Municipal Stormwater National Pollutant Discharge Elimination System (NPDES) permit. However, the discharge must meet federal and state water quality standards. If the effluent does not meet these standards, the discharge is considered illegal and therefore, prohibited (4-481).

Construction Traffic Management

In section 4.17.2, the DEIS notes that techniques shall be developed to reduce the traffic lane closures and a traffic management plan would be developed for each construction segment (4-482). Additional detail should be provided so that

reviewers can assess differences in the duration and magnitude of such lane closures and other measures among the project alternatives.

In section 4.17.2.1, the DEIS uses the language "should be avoided" (4-483/484, 4-888/889). The FEIS should describe how the impacts would be mitigated if they cannot be avoided. The DEIS does not discuss mitigation of traffic through all lane closures. This traffic re-routing may have a significant adverse impact to traffic flow on the other adjacent streets and arterials. This should be discussed, disclosed, and mitigated.

There is no mention of mitigation for garbage pick-up during street closures downtown and along other critical locations (4-888).

The use of intelligent traffic signal control as a construction impact mitigation will be necessary on temporary detour routes referenced on page 4-483 and the alternate routes described in the DEIS (4-512).

Integrating The Monorail

MISCELLANEOUS

DEIS Comments

City of Seattle Comments on the Seattle Monorail Green Line Draft Environmental Impact Statement

October 2003

City of Seattle

OVERVIEW

This Miscellaneous section of the City's comment letter includes technical corrections, errata, and detailed references for comments that are included in the other sections of the comment letter.

EXECUTIVE SUMMARY

Changes to the EIS text recommended elsewhere in the City's comments on the DEIS that would result in changes in the Executive Summary, especially the summary tables, should be reflected in the FEIS version of the Executive Summary.

TECHNICAL CORRECTIONS & ERRATA

General

It would be helpful in the document to give specific sections and/or pages within chapters when other chapters of the EIS are referenced.

The DEIS is organized by segment and route alternative within segment for Seattle Center. We understand that SMP defined interchangeable routing options in order to be complete in its coverage of potential impacts among the routes; we also understand that SMP needed to define geographic "route segments" to organize the comparative analyses. That said, the DEIS does not present a comparison of Seattle Center alignment alternatives that isolate the comparative quantifiable impacts of the route alternatives. The FEIS will more effectively aid decision making if it provides a comparative analysis of the impacts of the Seattle Center route alternatives. The FEIS should also more fully address impacts on Seattle Center facilities/properties be more definitive about SMP's responsibility for the cost of replacement facilities and or mitigation. The FEIS should provide a comparison that reflects the decision the City must make – namely, the specific differences in impact between routes as those routes differ in their service to Seattle Center. The FEIS should include a matrix of impacts comparing the routes that addresses (a) tree/landscape impacts; (b) business displacement impacts; (c) historic structure impacts; (d) capital and operating cost impacts; (e) impacts on/consistency with adopted Seattle Center and Neighborhood Plans; (f) construction impacts and mitigation; and, (g) on and off street parking loss.

Executive Summary

1-19 The last sentence at top of page 1-20 which reads "For more information, please see Section 4.9, Public Services and Utilities" should be moved to immediately follow the last sentence on page 1-19 as it is more applicable to the context of that sentence. A similar statement should be provided for the construction impacts that point the reader to Section 4-17 for that information.

Purpose & Need

2-1 Starting with the 3rd paragraph under Purpose and Need. This section describing the City's Intermediate Capacity Transit Study is inaccurate. The Study was conducted primarily to address mobility and the lack of transportation choices for Seattle residents, to improve transit's dependability, and improve Seattle neighborhoods' livability. The Study was not specifically designed because of the worsening traffic congestion.

2-2 4th Paragraph: Replace inaccurate text with following: "The City of Seattle, its partner agencies and consultant team, examined the feasibility of intermediate capacity transit starting in

June 2000. ICT technologies included bus rapid transit, streetcars and trams, and elevated transit. The Study, which was conducted in partnership with Sound Transit, King County Metro, Washington State Department of Transportation (WSDOT), and the ETC, was based on the following findings about Seattle's transportation needs:"

2-2 The three bullets should be replaced with the following text. – "Intermediate capacity transit service would link Seattle neighborhoods, especially farther-out neighborhoods, to the regional transportation system and to link Seattle neighborhoods to each other.
--Sound Transit's planned Light Rail project would provide needed regional transit service. However, many travel markets would remain underserved. There are significant north/south and east/west transit routes that require fixed guideway service.
--Existing bus service on city streets would continue to degrade due to traffic congestion. ICT service would improve Seattle's transportation system, providing more transportation choices and less dependency on cars. "

2-2 5th paragraph, 2nd sentence. Two of these corridors were Lake City/Northgate/ Ballard/Downtown Seattle and West Seattle/Downtown Seattle.

2-3 3rd paragraph, last sentence. The City's ICT study focused on five (5) not seven (7) corridors feasible for intermediate capacity transit.

2-8 Under 2.5.1 Regional Planning Context. The City of Seattle's Comprehensive Plan and Transportation Strategic Plan should be highlighted as well to provide a context for the ICT study.

2-8 The Comprehensive Plan should be described as follows: "First adopted in 1994, and amended annually, the City of Seattle Comprehensive Plan, Toward a Sustainable Seattle, is a 20-year policy plan designed to articulate a vision of how Seattle will grow in ways that sustain its citizens' values. Under the urban village strategy, the Comprehensive Plan provides a set of goals and policies aiming to concentrate growth into identified "urban villages" and "urban centers" where the highest densities of housing, jobs, and services already exist. This will place more residents near jobs and shopping opportunities, making it easier for them to conduct more of their daily business without driving. The concentration of residents and employees will also support better transit service. The Transportation Element calls for reducing dependence on cars, and for making transit, bicycling, and walking more convenient and attractive, particularly for commute trips. It calls for securing the funds necessary to preserve and maintain existing transportation facilities. It seeks to maintain and improve the ability to move freight and goods, and to preserve the character and livability of our neighborhoods."

2-8 The Transportation Strategic Plan (TSP) is the City of Seattle's guide for achieving the transportation goals outlined in the Comprehensive Plan. It outlines the specific strategies and actions required to achieve the transportation goals in the Comprehensive Plan. The TSP maps out the policies and investments required to achieve a healthy, efficient transportation system. The TSP proposed the Seattle Transit Initiative and the Intermediate Capacity Transit Study aimed at improving Seattle's transit service.

Project Description

3-21 Alignment of 6.1 and 6.2 on either side of Delridge stations appears to be incorrectly shown and labeled. Alignment 6.2 should be paired with Delridge 2 and so forth. Mistake also appears elsewhere including p.1-11, 4-137, and Exec Summary, fig. 1-6.

3-32 Text states "the alignment would continue further north along the east side of Warren Avenue W", however, drawing L03-10-02 (p 51 of 230) shows the alignment on the west side of Warren Ave N (not W). Which is correct?

3-40 Drawing GSAV-3D-A1001 in Appendix L shows site extending well into Parks property (about 130 feet, as scaled off drawing) but no detail is given for the rationale of the dimension of the site. How was the maximum footprint on this site determined?

Transportation

Under Parking Demand section for Ballard and all other segments, reference should be made to Appendix O where the parking study results are given by station area to better buttress these statements on utilization.

The Synchro files should be provided to SDOT. Some general mitigation tools used when signals (critical movements) are impacted by the SMP would be to revise signal timing/synchronization, adjust turning lane queue storage bay length, or revised channelization.

Impacts related to pedestrian conflicts with turning vehicles will create traffic congestion. The SMP may not use the default value of 50 pedestrians per hour in the CBD or near station areas. Near station areas and within the CBD the SMP should instead use actual counts and/or estimated counts that include volumes at near by intersections and station area pedestrian volumes.

The signal network in the CBD is coordinated and actuated signal timing cannot be accommodated.

4-1 It would benefit the readability and use of the Transportation section if an introductory section were added, similar to the introductory text on page 1 of the 4.3 Land Use and Neighborhoods Section.

4-1 Urban Centers/Villages: Belltown, Commercial Core, and Pioneer Square are each urban villages within the Downtown Urban Center. Seattle Center should be referred to as the Uptown Urban Center.

4-1 Include major bicycle facilities in among the description of "Major Transportation Facilities."

4-3 The description of the Queen Anne Avenue N/First Avenue N and Mercer Street bus transfer point should include Routes 15 local and 18 local.

4-3 Paragraph 5: what is the definition of a major transfer point?

4-4 Last paragraph. Check with Sound Transit about status of Route 570. Last May they were proposing that existing routing on Fauntleroy be combined with an extended Route 560 between the Airport and West Seattle. The segment between Alaska Junction and the International District would be deleted. Service between White Center, Fauntleroy, West Seattle, and downtown Seattle is provided by King County Metro Routes 20, 21, 22, 54, 55, 116, 118, 119, 136, and 137.

4-4 The description of the Sounder service notes that "the future Weller/King station of the Green Line would be within walking distance of King Street Station". The distance should be specified.

4-5 Other transit facilities - 1st bullet - Amtrak also provides service to Portland, Eugene & Los Angeles.

4-8 How is the term "regional" being defined when referring to "regional trails"? Delete "regional" or replace with "separated, multi-use."

4-8 DEIS says "For analysis purposes, the 1/2 mile distance was assumed to represent a reasonable travel distance for pedestrians and bicyclists accessing a transit station". Bicyclists average about 12 miles per hour in an urban setting, pedestrians only about 3.5 to 4.5 miles per hour. Consequently, a "reasonable" travel distance for these modes will be very different. The City suggests that a three mile travel distance be used as the travel distance to stations for bicyclists (about a 15 to 20 minute bike ride); and a maximum 1/2 mile travel distance to be used for pedestrians.

4-16 The Seattle Harbor Patrol is also…." should read "The Seattle Police Harbor Patrol is also…."

4-18 Last paragraph. "In general" or "Overall", all of the Green Line alternatives lead to beneficial changes in transit service. Some of the Metro route restructuring/reallocations could negatively impact some transit riders or potential transit riders travel times.

4-19 Last paragraph. Please include City of Seattle with SMP and Metro as working together to develop bus service proposals.

4-20 Service Frequency LOS- The Service Frequency LOS methodology in the DEIS is different than that used in the TCQSM. The TCQSM determines this LOS by destination from a given stop. If there is a transit trip with a transfer then the LOS for the trip would be the lowest LOS of the two transit rides. The screenline method for LOS used in the DEIS does not provide this information.

4-20 In the Service Frequency section, the text notes that "the year 2020 No Action service frequency LOS is also an improvement over existing LOS". Please indicate why this LOS is expected to improve.

4-22 Service Frequency: Please be more specific on the process used to develop the 'weighted average PM peak hour headways". Describe the technique, how 'weighting' was applied, and how weighting adjusted the average PM peak hour headways? If averaging, describe the range of frequencies during the peak hour service hours for transit years 2003, and year 2020 no action alternative. Describe the process of weighted averaging, including the range of frequencies to more clearly illustrate the 'Peak Hour Service Frequencies". Then compare the weighted averaging of the 2020 No Action and the 2020 Green Line Alternatives. Because this 'weighting' process is not included in the TCQSM, the additional information on how the 'weighted average was developed would help determine if the change in frequency is an advantage or disadvantage. Do the Average Bus Service Hours per Day presented in Table 4.1-11 represent p.m. peak hour service hours or daily service hours?

4-22 Table 4.1-9-Comparative Peak Hour Service Frequencies. Some explanatory text is needed to note that this table and others in this section compare the no action with a one-seat bus ride with the Green Line, which is a 2-seat ride for at least 50 percent of monorail riders (taking the bus to monorail station stop) with likely less reliability than those riders walking to stations directly.

4-22 Hours of Service LOS--This LOS measure can be used to show how service is effected in the Green Line corridor and in corridors that receive more service or less service due to Metro bus restructures.

4-23 The text states that "with the Green Line, many of the bus transit routes traversing the corridor may be truncated or eliminated to provide feeder service to the Green Line". Do the bus service hours presented in Table 4.1-11 reflect this potential truncation/elimination?

4-24 Transit travel time - Draft does not mention whether the 'average walk time to the station' would improve or increase compared to existing conditions.

4-24 The data regarding on-time performance of the monorail system note that "studies of monorail systems in the United States have shown that the monorail technology is between 99.5 percent and 99.9 percent reliable…" Are these systems operating in urban settings comparable to Seattle or Vancouver? If not, how applicable are these on-time results to gauging potential future on-time performance of the Seattle monorail system?

4-24 Table 4.1-12 has a column of data ("0.00-0.10," "0.11-0.20," etc.); it is not clear what these numbers represent.

4-25 Table 4.1-13 provides information on existing bus transit reliability, but does not indicate whether existing reliability measurements are assumed to hold for the future No-Action alternative. If this is the assumption, it should be explicitly stated. (If not, the 2020 No-Action bus transit reliability estimates should be provided.)

4-26 Table 4.1-13 implies that the estimated reliability of the Green Line will be the same (0.09 average coefficient of variation and LOS A) at all locations. As the coefficient of variation and level of service is a system-wide estimate, the table would be more accurate if the reliability information were shown once, with an indication that this system-wide information is a proxy for location-specific data.

4-26 The DEIS analysis should describe passenger load impacts on monorail & feeder lines versus one-seat rides with existing bus service.

4-27 Last paragraph. Street re-classification requires City Council approval.

4-27 Transfers - No information on how the Seattle transit system's transfer rate will be impacted.

4-29 Table 4-1-17 Bicycle trips should be listed separately from pedestrian trips.

4-32 Last paragraph. The document should note whether the ridership model assumes joint light rail train and bus use of the downtown transit tunnel.

4-35, 4-36 Pedestrian and Bicycle Facilities Analysis: Pedestrian LOS was analyzed using the methodology from the Highway Capacity Manual. However, the language does not make it clear what conclusions were drawn from this analysis.

4-36 In the second paragraph, there is a discussion of ADA requirements. The reader is directed to look at conceptual station footprints used for EIS analysis. These drawings do not show enough detail to ensure compliance with ADA and safety standards. It also does not identify where key pedestrian generators are which would have a significant connection to the station areas and therefore might require further analysis of pedestrian corridors.

4-43 First full paragraph where states that up to 90 spaces could be lost with addition of left and/or U-turn channelization. The "could" should be changed to "would."

4-44 Truck Circulation impacts: Instead of state classifications, refer to actual volumes from traffic records and/or City Major Truck Street classifications. The City does not use the state T-1 to T-5 system.

4-44 A special assessment should be performed for those street and roadways where over legal trips movements are known to operate to determine their ability to have alternative routes that can accommodate the over legal trip needs.

4-50/58 The DEIS should acknowledge the Thomas Street Overpass project, a funded project which will create a non-motorized connection between the Elliott Bay Trail (a major facility for bicyclists traveling from/to downtown) and the Mercer Station.

4-54 Table 4.1-34. SDOT will require the SMP to include signalized intersections on Mercer, especially Mercer/5th N in the LOS evaluation.

4-58 Bicycle and pedestrian access near 5th/Broad Station: The Dexter Avenue Bicycle lanes are not accessible to the 5th/Broad station due to Aurora Avenue. Aurora is also a barrier to pedestrian access. This should be noted in the DEIS.

4-61 1st paragraph, first sentence. Alternative 3.1 is stated to be located in the planting area, but the parking section states that the parking lane will be used. Please clarify.

4-61 Last paragraph, 1st sentence. Text should clarify that parking would be eliminated from the east side of 2nd Ave. Any new parking provided between columns on the west side of the street would be paid parking of in-kind meter technology. The City is launching a major effort this year to replace most of the single-space parking meters with pay station technology, where one or two kiosks are located on a block. (Also applies to statement on page 4-66.)

4-64-65 Does the monorail downtown segment pass through or near any High-Accident Locations?

4-66 1st line. 2nd Ave has a bike lane and a west-side parking lane. They are not a shared facility.

4-67 Parking meters in the City of Seattle operate between 8am-6pm Monday through Saturday unless where arterial parking restrictions or other space designations such as bus layover or carpool priority.

4-71 3rd paragraph. References to 1st Ave S, where guideway columns located in parking/travel lane. The "time-restricted" text should be changed to "peak period restrictions" since no parking is allowed during this time.

4-72 Last sentence in 1st paragraph. This sentence seems a bit overly generalized given the narrowness of the sidewalk on the west side of 4th Ave S and the very auto-oriented nature of the signalized intersection at 4th Ave S and S Jackson St

4-73 Table 4.1-48 states that 95 spaces from Seahawks Stadium North Parking lot will be displaced. This is different than what is indicated in the Station Footprint Plan. Any work in this area needs to be coordinated with the development plans for this property.

4-77 The discussion of a traffic signal at the California Avenue SW/SW Brandon Street intersection is confusing. The text states that Alternative 6.1 could provide a traffic signal at this intersection, but such a signal is already assumed at this intersection (see page 4-75 and Table 4.1-50). Additionally, the results in Table 4.1-50 indicate that such a signal would be required under Alternative 6.2 as well, as the average seconds of delay at this intersection would increase by 5.5 seconds in 2010 and 10.3 seconds in 2020.

4-78 Table 4.1-51 shows a footnote superscript in the 2020 Alt. 6.1 column, with no corresponding footnote.

4-81 Table 4.1-54, footnote c, refers to Table 4.1-56, when Table 4.1-55 probably is intended.

4-83 Fauntleroy Way SW is a Major Truck Street

4-89 Under Alternative 1.2 in the Ballard segment, reference is made to a new signalized intersection at NW 73rd Street/15th Avenue NW. Is this meant to refer to NW 63rd Street/15th Avenue NW?

4-89 Ballard segment - Alt 1.1 - first paragraph. If this paragraph is intended to summarize impacts, than the number of parking spaces removed should be included. It would also be advisable to move up the discussion of parking loss mitigation to immediately follow this paragraph, rather than its current location 3 paragraphs later.

4-91 Regarding the crosswalk marking for the north leg of 15th Ave NW and NW 87th St. Please see draft SDOT Director's Rule regarding guidelines for installation of marked crosswalks. SDOT does not recommend marking unsignalized crosswalks that cross 4 or more lanes of traffic.

4-94 With adding 20 parking spaces along 5th Ave N, depending the existing parking controls and adjacent land uses, paid parking technology would be installed in these 20 spaces, or load zones considered.

4-94 Where all-day parking was indicated to be added. The City will install paid parking technology along 2nd Ave, except where bus zone locations or where no parking is allowed.

4-95 The counts used for the 2nd Avenue & Columbia analysis appear to have an excess volume of turns and faulty LOS results.

4-98 The Significant Unavoidable Adverse Impacts section (4.1.4) indicates that the loss of on-street and off-street parking spaces in the Downtown segment "could be considered a significant unavoidable adverse impact". However, the parking discussion for the Downtown segment states "the parking losses shown in Table 4.1-43 are considered to be significant". This conclusion needs to be clearly carried through to Section 4.1.4.

Displacements & Relocation

4-67 Table 4.1-44 indicates a parking displacement at the Avis Parking Garage. The parking associated with the Avis rental car business is critical to the operation of the business, and should be identified as a business displacement if the lost parking spaces will make the operation of the car rental business infeasible. (Displacements & Relocation Section)

4-102 Table 4.2-1 does not allow the reader to connect the information on full and partial acquisitions to Table Q-1 in Appendix Q, which lists the parcels potentially affected by property acquisitions. This connection should be provided.

4-108 Table 4.2-3 does not allow the reader to connect the information on displaced businesses and households to the list of potentially affected properties in Table Q-1 in Appendix Q. This information should be provided.

4-11 The DEIS states "no major venues or performance spaces would be displaced." However, the Northwest Rooms and the Northwest Rooms courtyard are festival performance spaces. Also, The Fun Forest should be included as a business that would be displaced - not just two Fun Forest attractions. Mitigation to the Fun Forest for the two affected rides could include either relocation of the rides to the space currently occupied by the existing Monorail station, including construction costs to remove the station; or compensation to the Fun Forest for the lost revenue that these rides generate.

4-113 States "Development of the Seattle Center/Queen Anne 2 (South) station (Alternative 3.2) could require partial acquisition of a different area of the same parcel, requiring the removal of the Sonics/Storm Team Store." This station is part of Alt 3.3 and 3.5

Land Use

GENERAL The Green Line is an intermediate capacity system. Where adopted plans, policies and other references in this section and in Appendix U refer to a high-capacity system, that difference in consistency should be noted.

GENERAL Provide definition of "community resource" that is being used; if from NEPA guidance, cite document and page number. Generally, it is not clear in each of the segments what geographic area of coverage is assumed for identifying community resources in the "vicinity" of various station alternatives. Some segments (or station alternatives) appear to apply vicinity broadly, others more narrowly. "Vicinity" should refer to roughly the same geographic area across the segments and station alternatives, or the text should clearly indicate why a particular vicinity is considerably larger or smaller than normal. For example, under Crown Hill station alternatives, two elementary schools are listed that are over one-half mile from the station (North Beach and Loyal Heights). On the other hand, the Yesler station alternative does not identify Fire Station 10, which is approximately 800' from the station site. Other examples of vicinity issues include: the Dravus station alternatives note that Fire Station 23 is a community resource; however, Fire Station 20 is closer to this station area. Also, Lawton Elementary School is 4300' from the station area. The Howe station alternative section identifies several community resources that are some distance from the proposed station area, including Fire Station 41 (6000'), Coe Elementary School (3000'), McClure Middle School (4300'), and Seattle Country Day School (7300'). The Elliott and Mercer station alternatives section identifies several community resources that are some distance from the proposed station area, including St. Anne School (3100'), Fire Station 8 (3500'), and John Hay Elementary (4500'). Cooper Elementary School is approximately 2300' from the Delridge station area. Holy Rosary Elementary School and Seattle Lutheran School are both within 2000' of the Avalon station area. Fire Station 32 is approximately 1500' from the Alaska Junction station area. Fairmount Park Elementary is approximately 3100' from the Morgan Junction station area.

GENERAL It would be helpful to identify important major transit and street elements of existing conditions, such as entrances to the Downtown Seattle Transit Tunnel (noted once in description of the Yesler alternative) and major arterials near stations, such as Broad and Denny

near the Seattle Center stations. This will help provide a full picture of existing conditions from a pedestrian usage and land use perspective.

4-118 The text refers to the Green Line connecting "the City's urban center" to various urban villages. It should read "the City's urban centers" to reflect both the Downtown and Seattle Center Urban Centers.

4-119 1st paragraph: institutional is also a land use and is noted on Fig 4.3.1; please note in text as well.

4-121 Minor comment: Table 4.3-2 refers to the alignment segment of NW 46th Street/15th Avenue SW; this should be 15th Avenue NW.

4-124 Figure 4.3-2 Elliott/Mercer Street is not labeled on the figure.

4-125 Dravus 1 - incoherent sentence: "across 16th NW to the west of the 16th Avenue NW"

4-126 In the Elliott and Mercer Station Alternatives section, it is unclear why the text notes that "zoning capacity allows additional development in the area". Although this statement is not made elsewhere, it likely applies to virtually every station area, particularly outside downtown. Please clarify the purpose of this reference.

4-126 6th paragraph. While this paragraph states that 6.5 million people visit Seattle Center each year, the number should be 10 million, and the document should explicitly state that Seattle Center is a regional destination. This point is more explicitly acknowledged in the impact section, page 4-144.

4-128 6th paragraph. To remain consistent with the Ballard and Interbay segment sections, there should be some reference to the applicable neighborhood plans. (Also applies to 4-131, 2nd paragraph; 4-136, 3rd paragraph)

4-132 Pike Station: 1st paragraph: presumably land uses within 1/4 mile include residential as well as office and retail.

4-132 2nd paragraph. Acknowledgment of the Wells Fargo plaza on the east side of Second Avenue as a significant open space in the downtown would be appropriate, as it is acknowledged in the impact section, page 4-151.

4-133 1st paragraph: Int'l District is an urban village, not an urban center; it is part of the Downtown Urban Center. Note that the International District, like Pioneer Square, is a Special Review District (SMC Chapter 23.66) and, like Pioneer Square Mixed, is a zone (SMC 23.49.198)

4-133 1st paragraph, 1st sentence that begins "The SODO segment is made up of two neighborhoods..." is incorrect. The segment includes three neighborhoods, including Pioneer Square.

4-133 Last paragraph: Weller Street: Add neighborhood-serving retail and residential to list of uses in last sentence.

4-135 The new on-ramp to eastbound I-90 is being constructed in the S. Atlantic St right-of-way, not at S. Royal Brougham Way, as indicated in the Safeco Field station alternative

4-135 Artists' studios are also on 1st Avenue.

4-136 Industrial Business (2nd paragraph) should be Industrial Buffer.

4-138 Alaska Junction: This would be more accurately expressed as: "with a gradual transition to medium-density residential with one high-rise building."

4-140 4th paragraph, 2nd sentence that begins "However, given the predominantly ..." Please explain reasoning/rationale for this statement, which appears to confuse existing uses and the effect of the scale of the proposed project on those uses and future development. See also, general comment about distinguishing between compatibility with uses and compatibility with height, bulk and scale.

4-140 3rd paragraph, 2nd sentence that begins "No residences are displaced ..." compares number of properties and businesses acquired and displaced to number of blocks traveled. For the sake of fair comparison, the number of businesses and properties should be listed rather than or in addition to the number of blocks.

4-141 3rd paragraph, 3rd sentence that begins "The development of the monorail stations and facilities..." Please explain reasoning and rationale for this statement, especially in light of impacts to access to businesses along the west side of 15th NW.

4-141 "majority of residences lie to the west and north". Does this mean to the west of 15th and to the north of Market?

4-141 1st sentence (continuing from p.140): "no significant impact...given the increasing height of the bridge and the overall industrial/maritime uses…" Please clarify this sentence - how does the increasing height of the bridge help address impact?

4-142 (1st sentence) The statement is made that "With the Green Line guideway in the middle of the street, west side businesses could remain more visible..." Presumably, this statement can be made more confidently as "would remain more visible." However, if visibility is a benefit of Alternative 1.2, then impacts on visibility should be noted as an impact under Alternative 1.1.

4-142 last full paragraph: the 2nd sentence is incoherent.

4-142 There is a difference between the description of Interbay on this page and on page 4-123, where it is described as multi-family residential, with open space, athletic fields, retail, service, office, institutional uses, and recreational facilities.) Please explain why the fuller description of Interbay is not used here, where a different description is used to support the statement that there is lower potential for land use or neighborhood impacts.

4-143 First paragraph: A statement about improved mobility and area-wide access follows a discussion of displacement of the QFC and enumeration of high populations of low-income households. How is improved mobility and access relevant to this discussion of specific impacts?

4-143 The discussion of the Elliott and Mercer 1 (Center) station states that "the center of street alignment would increase delays for southbound vehicles turning east onto Mercer Street at peak hours, but delays would remain at acceptable levels". The text should either provide specific information about changes in delays at this intersection, or provide a cross-reference to the location in the Transportation section where this information can be found.

4-145 Alt 3.1, first paragraph, last sentence: Reference to long-term replanting and landscaping should be cross-referenced in mitigation if this is a proposed mitigation.

4-145 Second full paragraph - the reference to "some of the previous layouts of these events" could be more clearly stated as "festival layouts from previous years."

4-145 Last partial paragraph - the discussion of Monorail ridership at Seattle Center would be easier to understand and more comprehensive if presented with a timeline - current ridership, expected impacts during construction (once current monorail line is removed), initial ridership from new monorail line (at new location) and 2020 ridership. The impacts of each of these time periods on Seattle Center functions should then be included in the analysis.

4-145 The discussion regarding alternatives and which ones would require the removal of trees is not clear. The first sentence implies that only the Thomas alternative would require the removal of trees, while in fact both the Republican and Thomas Street alternatives would require the removal of trees at Seattle Center. The stand-alone statement that the Mercer options "would also pass the Mercer Theater District and require the removal of mature trees on the east side of the block..." implies that the trees removed in the Mercer option are more significant. If this is so, this needs to be explained more thoroughly. Suggest addressing the alternatives separately and not in the same sentence for fairness of comparison.

4-146 First full paragraph. Alternative 4.1 referenced in 3rd sentence should be "Section" to refer to Transportation section.

4-146 The statement "primary effect is visual" should also cross-reference impacts on trees - please cross-reference Plants and Animals section.

4-146 There is little if any mention of the impacts to the greenbelt at the west end of Memorial Stadium should Alt 3.1 be chosen. This is a significant green belt from a visual and bird habitat standpoint. It is also the site for Seattle Center's propane storage area (see comment on page 4-456 for details).

4-146 to 4-148 Discussion of "recognized defining line" or "established line defining separate zones of the Center", is overstated. These zones were for use in improving the readability of the Master Planning document, and did not imply any separate zones on the ground.

4-147 3rd full paragraph. The statement is made that a large amount of real estate would be removed from private supply. Is this an impact? What would the consequences of the removal be? Please cross-reference analysis of this in Economics.

4-147 Statement is made that "noise impacts would be lessened" - please cross-reference the page in the Noise section where this is analyzed.

4-148 First Paragraph: Reference to loss of parking on the north edge of Mercer because of addition of columns - please cross reference transportation section and identify effect on utilization rate.

4-148 Alternative 3.3 (Thomas) last paragraph: vegetation removal - cross reference Plants and Animals

4-148 Concerning the statement (about the Thomas Street route – Alternative 3.3) "Development of the Green Line would require avoiding conflicts…" How would conflicts be avoided? What impacts would result if conflicts are not avoided?

4-149 The discussion of impacts of Alternative 3.5 (Denny) should indicate the impacts of guideway and column placement along Denny Way.

4-149 The discussion of neighborhood impacts in the Downtown segment notes that "the visual and setting impacts to historic resources would affect the visual context of some historic resources, particularly in Pioneer Square. However, the improved access to the Pioneer Square Historic District and the Pike Place Market Historic District would likely benefit continued economic vitality." It is not clear how enhancing economic vitality will reduce impacts to the visual context of historic resources.

4-150 Alternative 4.1, 3rd paragraph: Re: "loss of surface parking" - quantify the impact of this loss on utilization and cross-reference Transportation.

4-150 Fourth full paragraph: identify the demolition of the Centennial Building as a significant adverse impact and cross-reference Cultural/Historical Resources. (Land Use Section)

4-151 2nd paragraph: "An adverse effect to the historic resources has been identified…" State specifically what the impact is, whether it is a significant adverse impact, and cross reference cultural/historic resources.

4-151 Pike 2 (East) - Please quantify the effect of loss of parking on utilization rate and cross-reference Transportation.

4-151 Madison 2 (East) Discuss whether loss of the plaza affects open space goals for downtown.

4-152 1st sentence: There is a reference to the loss of two major sources of parking. Quantify effect of parking loss on utilization and cross-reference Transportation.

4-151 Alt. 4.2, second paragraph. "The presence of the overhead guideway could affect future development of the property to the intensities allowed under existing zoning." Please clarify how future development would be affected.

4-151 1st paragraph: The statement: "If the station were designed to accommodate the potential for future development, it could support plans and zoning…" Please state whether the station will be designed to accommodate this potential. If it is not so designed, please state whether it will support plans and zoning for the area.

4-152 A reference to loss of 200 parking spaces is made. Please quantify the effect of this loss on utilization rate and cross-reference Transportation.

4-152 Madison (3): Does this center platform station with a mezzanine have the same visual impacts as Pike (3)?

4-152 Yesler (2): What does "both alternatives" refer to? Is this a reference to something besides the Yesler (2) alternative?

4-152 Under SODO segment, regarding North Stadium parking lot. The Transportation Section lists this loss as 95 spaces in Table 4.1-49, page 73

4-153 Third full paragraph states that Lander 2 would require the Home Depot parking area, although the Transportation Section Table 4.1-49 lists that Lander 2 affects the SODO customer surface parking lots at 131 spaces. Is this the same parking area?

4-154 4th full paragraph: Why state here that parking needs to be replaced (for a large retail store) and not for the QFC at Dravus or the Walgreen's at 15th NW or at the grocery store/coffee shop referred to in this same paragraph?

4-154 Last sentence, second to last paragraph: Recommend changing the following sentence (additions in parentheses) "Improved access to the Longfellow Creek Greenspace would benefit the public to a degree but could adversely impact creek habitat and water quality if the creek is disturbed by (increased numbers) of the visiting public - (pedestrians and vehicles associated with the station and with future development of support facilities).

4-155 The text notes that "Alternative 6.2 has the potential to remove more parking spaces than Alternative 6.1". It should be noted whether these are on-street or off-street spaces (or both).

4-155 Last paragraph in Section 4.3.2.1: Recommend adding to the end of the following sentence (additions in parentheses): The Delridge Station 2 (Andover) would be further removed from Longfellow Creek (which might buffer the creek and greenspace from some of the increased pedestrian traffic associated with the station, but would not buffer it from increased pedestrian and vehicular associated with future development of on-street support facilities).

4-155 and 4-156 Under 4.3.2.2 Consistency with Adopted Plans and Policies: Please add the adopted Longfellow Creek Watershed Action Plan, adopted by Seattle City Council 28620, October 1992 to the list of planning documents.

4-156 It is not clear what is intended by the last sentence on this page, which states that "The Green Line would support and just conflict with the general public goals and objectives of these plans…"

4-158 For Alternatives 3.1, 3.2. 3.3, 3.5 the statement is made "However, the Green Line's transportation improvements could also provide offsetting benefits, (to the displaced Key Arena operations offices) which would also reduce the impact." Transportation benefits can not be used to "offset" non-transportation impacts.

Visual Quality

4-171 SEPA viewpoint Kinnear Park is shown in the view shed which by definition means it is visible.

4-171 Table 4.5-1 Add Ballard Bridge and Walrus Level as a visual resources under visual resource listing.

4-187 The description of Queen Anne/Seattle Center/Belltown Segment should include a description of the Center itself including the theater, museums, sports and other cultural facilities.

4-189 The description of the Downtown Segment should include the Financial District, the edge of the retail core as well as Pike and Pioneer Square Historic Districts.

4-190 The name of the 'Vulcan Building' is the 505 Union Station building.

4-190 Include the Wells Fargo Open Space in the list of arcades, plazas and open spaces.

4-198 through 4-205 Description of impacts for this segment should refer to "affected" trees inventoried in Appendix W.

4-200 Table 4.5-11 Legend does not include "B".

4-200 through 4-205 While some detailed information is present on number of trees to be removed, it is not consistently detailed. Additionally, this information should be presented in Section 4.15

4-201 See notes (to p. 4-456) on tree trimming of Seattle Center trees in Section 4.15 Plants and Animals

4-201 See notes (to p. 4-457) on issues with planting trees in lawns at Seattle Center in Section 4.15 Plants and Animals

4-205 "The Center House, a historic resource, would have adverse impacts..." sounds as if the Center House is the source rather than the object of the impacts.

4-206, 4-209 Term "Shade Protected" in table is not explained.

4-207 The list of Downtown streets where upper level setbacks are required should also include Seneca Street.

4-210 Change language from "could" to "would" be obstructed in reference to visual impact on the decorative band between the third and fourth stories of Bon-Macy's and the Securities Building.

4-216 Table 4.5-15 should list "Potential Impact" for West Seattle Stadium as "Proposed changes will cause impacts…"

Air Quality

4-221 Third full paragraph concerning Clean Air Agency Regulation I. The DEIS states that these regulations "may" apply. Reader should be referred to 4.6.2.1 for additional information on how the determination is made.

Noise & Vibration

4-234-235 4.7.1.3 Last paragraph refers to Seattle Noise Ordinance 25.08.425.C; Clarification: this section is only for construction that takes place in commercial zones where both generator and receiver are in the commercial zone.

4-236 Table 4.7-6: In this table the Fisher Pavilion Roof is used as a measurement location. Was any construction taking place in the building or was any mechanical equipment in operation during the measurement?

4-238 Section 4.7.1.7, paragraph 1: While it is true that average monorail train speeds will be lower than 50 mph, many segments of the SMP guideway will permit 50 mph speeds, and any adjacent structures will receive higher vibration levels on those segments. This should be included in the paragraph for a balanced assessment of the expected vibration levels due to train speed.

4-239 Section 4.7.1.7, paragraph 2: The date and laboratory location of the last NBS traceable laboratory calibration of the Spectrum Analyzer and Vibration Calibrator should be provided in Appendix R, with the expiration dates.

4-239 Section 4.7.1.7, paragraph 5: The duration of the RMS averaging should be stated here (not just in Table 7).

4-239 Section 4.7.1.7, paragraph 6: Criteria for vibration-sensitive facilities would be appropriate at this point in the DEIS text, and should be provided.

4-239 Section 4.7.1.7: How were monorail speeds measured? What is the uncertainty of the speeds?

4-239 Section 4.7.1.7, last paragraph on this page: The 12 dB increase for a distance of 10 feet does not say relative to what distance, i.e. starting where?

4-240 Section 4.7.1.7, first paragraph on this page: The statement of method implies that anomalous high data is being thrown out. What is this based on?

4-240 Section 4.7.1.7, first paragraph on this page: The source of the "published data" should be cited, and its detailed content provided in Appendix R. The FTA curves are not conservatively high and this claim should be removed from the paragraph. See comments on section 4.7.1.8, below, for why the FTA curves are average values, not high values, for the SMP sensitive receiver site conditions.

4-240 Section 4.7.1.7, 2nd paragraph on this page: This repeats the speed effect discussion above, and should be deleted.

4-241 Table 4.7-7. Most of the data in this table, for the passing monorail, shows vibration levels within the noise floor. The implications of this should be discussed.

4-241 Section 4.7.1.8, paragraph 1 and 2. The likelihood of two trains passing an expansion joint simultaneously depends upon the length of the trains and the spacing of the expansion joints. Provide a calculation of the fraction of train passages where the assumed condition would occur, and discuss the implications for the expected vibration levels. Revise paragraph 2, removing the claim of conservatively high, unless this can be justified with a cogent and complete analysis of the 50-mph, two-train scenario.

4-242 Section 4.7.1.8. The text of paragraph 4, taken from FTA report (paragraph 2, p. 10-3), claims that the distance propagation curve for rubber-tired vehicles is an upper range of the expected vibration, unless there are "extenuating circumstances." The subsurface rather than at-grade bearing of the monorail columns, and the wheel impacts on beam expansion joints, are just such extenuating circumstances. The FTA curve is derived from at-grade vibration data, on smooth surfaces, noted on p. 10-5 of the FTA report: "Rubber-tire vehicles rarely create ground-borne vibration problems unless there is a discontinuity or bump in the road that causes the vibration. The curve in figure 10-1 shows the vibration level for a typical bus operating on smooth roadway." Claims in the DEIS that the curve in fig. 4.7-4 is an upper range should be removed.

4-242 Section 4.7.1.8, paragraph 3. Why is the level difference 6 dB and not 3 dB? (The definition of dB is an energy ratio.) This should be examined and revised if necessary.

4-243 Since the curve of Figs. 4.7-3 and 4.7-4 represent a single bus drive-by, whereas the monorail is effectively a sequence of buses, dynamically linked to each other, the character of the propagation curve may be substantially affected. A higher level of the curve at mid-distances should be assumed, in the range from 30 to 150 feet, to allow for the uncertainty in the vibration propagation due to these substantial differences.

4-243 The attenuation of vibration with distance is provided as fig. 4.7-3, from FTA manual's fig. 10-1, with rubber tired vehicles. The figure following (fig. 4.7-4), derived for the monorail rubber tired train from this generalized propagation curve, has an entirely different character due to an unfortunate change in the abscissa scale (linear rather than exponential). Fig. 4.7-4 should be revised to allow direct comparison.

4-243 The analysis used to derive fig. 4.7-4 should be included in Appendix R to demonstrate validity of the derived values, and the assumptions involved in the analysis should also be stated there.

4-244 A site test using a impact demolition tool (back-hoe mounted), driving the ground at possible guideway column locations, should be included as an optional means to explore vibration-induced noise sensitivity at all facilities listed. Add this requirement to the construction vibration section.

4-247 Traction Power Substations - given the number of existing traction power substations in the area (Metro's trolley bus program, for instance), it should be relatively easy to do noise measurements and projections.

4-247-4-264 4.7.2.2 The distance between the rail and the adjacent buildings along the routes are not disclosed. This should be on a table for each alternative.

4-256 States "During quiet times in the Center, the Green Line would be clearly audible at outdoor locations on the lawn north of the International Fountain, but Green Line noise would not substantially increase sound levels over the existing acoustic environment." This statement appears to apply to Alt 3.1, not Alt 3.2

Public Services & Utilities

4-280 "To maximize the power consumption efficiency of the monorail trains and ensure good power quality, the monorail system supplier will he required to maintain average power factor of 0.95 and to comply with the IEEEE, Inc. Standard 519-1992." Identify what the supplier means. Will the average power factor and standard be contained in the DBOM contract? Please include statement concerning these specifications and the contract.

4-280 Table 4.8-3. Green Line Operational Energy Use in KVA. It is not clear whether "Stations" load is typical load for one station or the total stations' load. Please clarify.

4-280 "Traction power substations" is used in paragraph 2 while "train propulsion system substations" is used in paragraph 3. Please clarify.

4-281 4.8.3 - Mitigation. Reference is made to implementing SMP's "environmental sustainability policies" without further reference or explanation.

4-281 Paragraph one please add: Regenerative power would be restricted to the Monorail electrical system and would not pass beyond the SCL point of connection.

4-281 "SMP will work with SCL to implement SMP's environmental sustainability policies as it designs facilities". Please include specific examples of how such policies could be implemented as they pertain to electrical energy. One example might be use of regenerative braking.

4-290 Distribution lines are almost always in a horizontal configuration, not a vertical configuration, as stated here.

4-292 Reference to the location of specific recommendations for improving vehicle access and circulation in locations where guideway columns would be provided in an existing center two-way left turn lane should be 4.1.3 not 4.1.6.

4-292 Seattle Center-SCL owns, operates and maintains the campus distribution system (26kV).

4-292 4.9.2.1- Emergency services could be impacted if a monorail train gets stuck under or near to a Seattle City Light feeder that has only the minimum NESC safety clearance. If there is not enough clearance for emergency personnel to work safely, extra time would be required for Seattle City Light to deenergize and clear the lines, if possible.

4-295 Sec. 4.9.2.2, 3rd paragraph, 3rd sentence: Add "or guideway beams" after "Where foundations"

4-296 9.9.2.1 comment - Need to consider lateral foundation loads on close utilities.

4-296 9.9.2.1 comment - Need to consider dynamic (vibratory) foundation loading due to the train operation. Close utilities could be impacted from vibration induced settlement.

4-296 4.9.2.2 First full paragraph, last sentence. The way the project is phased may require service from Canal, Broad, South or Delridge substations.

4-296 "Power demand for Green line operation would not significantly affect City Light's regional capacity, although upgrades to some transmission lines and power substations may be required." Replace "regional capacity" with "sources of electrical energy available to SCL", and add "due to limited capacity of the existing distribution infrastructure to distribute electrical energy" at the end of this sentence.

4-296 4.9.2.2 Fourth paragraph last sentence "Design and construction of foundations systems would not ..." Depending upon soil conditions and construction methods, settlement of utilities or pipes could happen. This will need to be mitigated during design.

4-296 "As discussed in Section 4.8, Energy, the Green Line would be replacing fossil fuel sources for transportation, but could potentially increase the electricity demand and consumption on the existing electrical system in the project area." Change "could potentially" to "would".

4-296 The DEIS refers to fencing in the guideway at the Delridge Station to protect the creek. Please add to the long-term utility impacts or mitigation section that the SPU access gate needs to be maintained to allow the utility to conduct spawning surveys and to maintain the trash rack at the inlet of the Andover culvert.

4-290 4.9.1.2 - Electrical Service. Seattle City Light has a number of electrical network facilities and/or duct banks located along certain alignment sections or that cross alignment segments. SMP must work closely with SCL in determining appropriate locations of guideway and station columns so as to avoid impacting these duct banks. Segment impacted include 3.1, 3.2, 3.3, 3.5, 4.1, 4.2, and 4.3.

Parks and Recreation

General: All figures that illustrate "Segment 6: West Seattle" appear to be incorrect: the alignment of 6.1 and 6.2 to the west of the Delridge stations appears to be incorrectly shown and labeled. Alignment 6.2 should be paired with Delridge 2 and so forth. This mistake appears throughout the document and engenders a great deal of confusion. As a result, all references in the EIS to alignment alternative numbering in West Seattle and all comments here related to alignment alternative numbering in West Seattle should be carefully reviewed for accuracy.

4-298 Table 4.10-1 Several names on this list should be corrected: "Westlake Square" rather than "Westlake Park" "West Duwamish Greenbelt" rather than "West Duwamish and Pigeon Point Greenbelt" "Longfellow Creek Greenspace – Yancy" rather than "Longfellow Creek Green Space – Yancy." These names should be corrected throughout the document.

4-298 A better way to refer to the Longfellow Creek Greenspace in Table 4.10-1 is to describe it

as "Longfellow Creek Greenspace at Yancy"

4-299 Table 4-10-2 Correction to implementation status of The Longfellow Creek Legacy Trail - the Legacy Trail is not complete. The Pro Parks Levy funds additional elements. The City continues to identify and implement key actions to develop remaining segments of the Legacy Trail Plan in coordination with the Delridge and Westwood Neighborhood Plans.

4-302 Refer to the greenspace as "Longfellow Creek Greenspace at Yancy." Also, the creek actually flows through a number of greenspaces and parks including the West Seattle Golf Course.

4-302 The Dragonfly Pavilion is planned to be located at 28th Ave SW and SW Dakota Streets in the upland area of the greenspace, not in the creek and buffer area.

4-302 Section 4.10.1.6 Longfellow Creek Greenspace paragraph: Seattle Public Utilities has invested over $4 million in restoration of the creek at this site, along with help from volunteers in the community. In 1999 and 2000, the utility carried out a large-scale restoration project in Longfellow Creek between SW Yancy St. and SW Genesee. Approximately 1,000 feet of creek was enhanced.

4-302 Section 4.10.1.6 Longfellow Creek Greenspace paragraph: The "community effort" identified in this paragraph has taken place over a span of 15 years and has included numerous local organizations and funding from many local businesses.

4-302 "Section 4.10.1.6 Longfellow Creek Greenspace paragraph: Please change the comment "There has been a community effort to improve the stream (Longfellow) for several years, including yearly fish releases conducted by local schools....." to: "There has been a community effort to improve the stream for several years, which included, among other efforts, yearly fish releases conducted by local schools between 1990 and 1999. Schools stopped releasing fish in 1999, to make it easier to assess natural salmonid production in Longfellow Creek. To this end, SPU has been conducting weekly salmon spawning surveys each fall since 1999, and lismolt trapping for 9 to 12 days each spring since 2001. (Katherine Lynch, Urban Creeks Biologist, SPU, personal communication)"

4-302 Refer to the greenspace as "Longfellow Creek Greenspace at Yancy." Also, the creek actually flows through a number of greenspaces and parks including the West Seattle Golf Course.

4-302 The Dragonfly Pavilion is planned to be located at 28th Ave SW and SW Dakota Streets in the upland area of the greenspace, not in the creek and buffer area.

4-305 Fifth and seventh paragraphs. Since impacts to Longfellow Creek Green Space are noted on page 4-307 as "significant unavoidable adverse impacts", the assessment on page 305 should be consistent and also indicate this degree of impact.

4-305 and other pages. It in unclear from references in the DEIS as to whether a new park or open space is proposed for the western portion of the Sinking Ship Garage site (Yesler 1 Station). (See 4-211, 2nd paragraph; 4-305, 1st paragraph; Figure M-66a; Figure M-66b; and 4-338, 6th paragraph.) It is unclear to what degree this would be considered parkland and come under the jurisdiction of the Seattle Parks Department. Please clarify.

4-302 & 4-303 Section 4.10.1.6: correction: The West Seattle Segment area has 4 existing parks and 3 designated Greenspaces. City Resolution 28653 (1993), Open Spaces Policy, designated (in the segment under discussion) the West Duwamish Greenbelt (includes Pigeon Point), the Longfellow Creek Greenspace, and the Eddy Street Ravine.

4-305 & 4-306 Section 4.10.2.1 Long-Term Impacts - Longfellow Creek Greenspace, West Seattle Golf Course & Camp Long: The choice of the Dragonfly Pavilion as a reference area for impacts to the site seems inappropriate in that it is not yet built (although once constructed it will be an additional focal area for educational groupings); the Greenspace from SW Yancy to SW Genesee Streets is 5.65 acres, a significant area and the beginning of the " green corridor" through the Delridge Valley which includes the Golf course, Camp Long and other Greenspaces (total of 30acres) along Longfellow Creek.

Cultural Resources

General/Areaways (1) In the descriptions of Yesler 1 (West) station on page 4-338, N-191, N-207, N-208, and N-211, the demolition of the Sinking Ship Garage (also known as the 2nd & James Garage) is described but there is no mention of the impact to the areaway that shares a party wall. The lack of areaway inclusion is further reinforced on page 4-502 in the statement that construction impact from demolition of existing structures would not exceed 95VdB. This statement does not account for the demolition of the Sinking Ship Garage that shares a party wall with the Sinking Ship areaway.

(2) The areaways are initially consolidated under one heading (D-127) on pages 4-324 and N-190, and on pages 4-322 and N-190. In these instances they are listed as NRHP eligible. Then on page N-173, D-127 is identified only as the Sinking Ship areaway site and as ineligible for the NRHP. Furthermore, no preliminary evaluation of effect was done for the areaways in Table N-2.

The areaways are identified in the archaeological section of the DEIS as having been surveyed; however, no determination is made in the archaeological section as to their eligibility, nor are these surveys referenced in the eligibility determinations made in the historical resources sections. The letter of August 7, 2003 from Allyson Brooks, State Historic Preservation Officer, to Kimberly Demuth, Senior Consultant with Entrix, Inc., finds that the Sinking Ship areaway is not eligible for listing in the NRHP under criterion D (i.e., archaeology). However, in the Pioneer Square Historic District Areaways Hazard Mitigation Study prepared by the City of Seattle Department of Transportation, Sheridan Consulting Group and Parsons Brinckerhoff (March

2003), the Sinking Ship areaway [page N-345, SDOT #601, PSHD #76, 515 2nd] rated a one on a scale of one to four with one being the most historically intact and significant. Another letter from Allyson Brooks to Kimberly Demuth on August 7, 2003 finds that the areaways are eligible for listing in the NRHP under criterion A (i.e. historical significance).

(3) With regards to construction impact, the areaways are included under the 95VdB "extremely fragile" level (pages 4-334, 4-534, N-195), then in Table 4.17-6 (pages 4-507 through 4-510) and Table N-3, pages N-200 through N-202, the areaways are identified as 100VdB "sensitive" rather than 95VdB "very sensitive."

In addition, pages 4-325, 4-333, 4-337 and N-207 state that areaways would be affected by vibration during operation or construction, although not adversely affected. On page N-8, it states that the Green Line would have an effect but no adverse effect on one historical resource; it actually would have no effect on seven historical resources. These statements do not account for the Sinking Ship areaway and other areaways along the Second Avenue Extension South that are potentially in immediate proximity to the Green Line foundations as indicated in Appendix X (fig. 2 stage 1; fig. 4 stage 2; fig. 6 stage 3; fig. 12 stage 6; fig. 16 stage 8) and the demolition of the Sinking Ship Garage."

4-321 and 4-322 Table 4.11-1: D-79 - D- 127 are also listed in the local Pioneer Square Preservation District (PSPD) and should be acknowledged as such on the table.

4-323 Segment 4: Downtown Segment, 2nd paragraph: When referring to the Pike Place Market, the National Register listing is the "Pike Place Public Market Historic District" and the local district is formally the "Pike Place Market Historical District." The local district is larger than the National Register district; therefore, the statement: "The local Pike Place Preservation District shares similar boundaries" is incorrect. Please revise in text and in Appendix N.

4-337 Change language from "may" to "will" block views of significant architectural details….and "could" to "will" block views of the decorative belt coursing located above the second story…

4-338 Madison 1 (west) add: demolition of the Federal Reserve Building would cause an adverse visual affect due to loss of visual fabric and change to visual context of adjacent historical resources.

4-341 4.11.4 Memorandum of Understanding: should be Agreement instead.

4-343 Segment 4 Downtown Segment: change language "could" to "will" block views of the decorative belt coursing…

4-344 Section 4.11.5.2 change language "could" to "will" have a significant unavoidable adverse impact by altering the character…"

Environmental Health

The document would be improved by specifying a method of releasing information about the environmental performance and discoveries that occurs throughout the project. The communications methodology shall provide the reader and/or interested party with a verifiable system under which the environmental knowledge is distributed, beyond a need-to-know basis.

The section does not acknowledge that contamination interactions will increase costs, create service disruptions, and add time delays. This information should be added in the FEIS.

Specifics on handling and management of process waste waters and storm runoff were not presented in this section. This should be added in the FEIS.

4-354 Section 4.12.4.2: It is well stated in the last sentence of the first paragraph that "releases to groundwater probably have the greatest potential to affect construction activities because of the high potential for the contamination to migrate." However, the discussion of this issue dealing with contaminated soils has been very difficult to follow in the DEIS as the information is scattered throughout various sections without clear direction on where to find information. For example, on page 4-453 the reader is directed Section 4.17, Construction which is over 93 pages long.

Earth

The references by Shannon & Wilson, the geotechnical consultant, should have been available in the DEIS appendix as essential supporting information. It should be included in the final EIS document.

Reference of "Griswold, 2003" is not an appropriate reference in any of the 5 citations in the EARTH section. Information informally given should have been verified by the SMP prior to inclusion in the DEIS.

4-379 4.13.1.3 Analysis of the Segments and Alignment Alternatives; Segment 2: Interbay Segment. See last paragraph in this segment. Landfill areas and the area within 1000 feet of a methane-producing landfill are mapped in the City mapping system. If these are to be considered geologic hazard areas for purpose of this EIS, its mapping unit should be acknowledged, along with the other geologic hazard areas cited in this section.

Water

4-390 The impacts are not determined based on the change in impervious surface but on the disturbance of 1 or more acre or the addition or replacement of 5,000 square feet of impervious surface per SMC 22.800.

4-391 The DEIS analysis of the requirements of Seattle's Stormwater, Grading and Drainage Control Code is not accurate. The project will be required to mitigate for new and replaced impervious surface not the net change of impervious surface.

4-392 Sec. 4.14.4.1, 2nd paragraph, last sentence: Change last sentence to: "The Green Line would not affect these special conditions."

4.398 Table 4.14-1: References are not included in App. H. Convert PCBs and TAT to mg/kg dry weight to make it easier for people to compare concentrations with those in Table 4.14-2.

4.399 Table 4.14-2: Please provide the reference(s) for the samples in the table.

4.399 Lake Union: It should be mentioned that Lake Union supports an important salmon migratory route.

4.400 Duwamish River: It should be mentioned that the Duwamish River supports an important salmon migratory route.

4.400 Longfellow Creek, 2nd paragraph: references cited are not included in App. H

4-400 In Section 4.14.4.1 Receiving Water Bodies - Longfellow Creek, the statement beginning "Because the Longfellow Creek basin has been developed, ..." is incorrect. There are over 100 acres (30 acres of open space in addition to 68 acres of Camp Long and additional acreage of the Golf Course (~15 acres) in the Delridge Valley) of undeveloped land in the basin.

4-403 3rd paragraph, 1st sentence: Change "could" to "would" in reference to increased stormwater discharges to the combined system, if unmitigated.

4-403 4th paragraph, 1st sentence: Change "could" to "would" in reference to the impact the stations and the operations center would have on water quality if not mitigated.

4-403 5th paragraph, 1st sentence: Change "could" to "would" in reference to industrial activities at the Operations Center.

4-403 5th paragraph, 2nd sentence: Change "could" to "would" in reference to sources of pollution resulting from station sites, pick-up and drop-off areas.

4-405 Table 4.14-3. Column headings are not consistent with the rest of the tables showing PGIS'. Use the same headings as in the other tables. Please clarify why only the bolded numbers are included in the total. It says that it's because some alignment alternatives also contain station alternatives...this table only shows station alternatives.

4-405 through 411 PGIS tables: Is the project converting the difference between the existing PGIS and the proposed PGIS into NPGIS?

4-407 1st paragraph, 3rd sentence: Please provide back up information justifying the certainty of an improvement in the runoff quality if the station sites were constructed.

4-410 The project must comply with the City's drainage code and provide water quality treatment based on the square footage of disturbed surfaces, not on trade-offs or offsetting of pollutants in one area for another.

4-411 Table 4.14-11: Please cite reference to the Potential to Impact Surface Water for standard truck tires and standard truck brakes.

4-413 4th paragraph, 5th sentence: DEIS states that "The amount of pollutants released from the monorail brakes and tires is anticipated to be considerably less than from buses." Per Table 4.1-11, there'll be an increase in bus/monorail average operating hours by 2020 compared to No Action. Please explain why the statement is anticipated to be true.

4-413 3rd paragraph, 1st & 2nd sentences: Change "could" to "would" in both sentences. Last sentence: pollutants from the project must be mitigated, regardless of whether the amount would increase the existing concentrations in the water body above toxic levels.

4-414 1st paragraph, 2nd to last sentence: The statement that the effect on the water quality of receiving waters would be similar for any of the alternatives ignores the fact that Longfellow Creek is much more sensitive to the introduction of pollutants and water quantity, that the Duwamish River is an estuary and that the Ship Canal is on a fresh water lake. Each of these water bodies and the wildlife and aquatic life they support responds differently to stormwater pollutants.

4-414 3rd par, 2nd sentence: Please justify (cite water quality studies) the statement that the Green Line could result in positive impacts to water quality when the project is predicted to

reduce overall vehicular traffic by only 1.1% by 2010. That percentage is well within the variance of water quality testing results for all the waterbodies this project affects. If this project is required to construct a new outfall, it is the City's experience that this takes a significant amount of time and resources to design and acquire permits from various agencies. The City will require a drainage plan to be developed showing the discharge location during the design phase.

4-415 1st paragraph, 3rd sentence: Change "could" to "would". This project is required to comply with the City's stormwater code.

4-418 Table 4.14-17: Do the Estimated Facility Volumes for Delridge 1 and 2 include the amount for enhanced water quality treatment?

4-418 Off-site Access. Without describing the location and size of these off-site access areas no determination of significance can be made.

4-418 1st paragraph: If the off-site pick-up/drop-off areas and bus layover areas are redeveloped and trigger the drainage code, these areas will require mitigation.

4-419 3rd paragraph, 2nd sentence: The reduction of vehicular trips does not impact the need to mitigate the impacts the project will have on water quality due to its operational or construction activities. Please include a discussion about the future removal, replacement or repair of the in-water bridge supports and the associated impacts to water quality.

4-419 5th paragraph, 1st sentence: Determining the water quality thresholds for the project as a whole or in parts will need to be discussed with the City, since the project doesn't just drain to one water body.

4-419 & 4-431 Is there any relationship between pollution generating impervious surfaces (PGIS) and effective impervious surface? Why would PGIS decrease (Table 4.14-8) while effective impervious surface would increase (Table 4.14-24)?

4-420 last paragraph, last sentence: Add ", streets or buildings" after "…raw sewage into receiving water bodies"

4-420 Last Paragraph 4.14.2.3, 4th paragraph, 4th sentence: Include information on additional impacts caused by new impervious surfaces draining to the storm system. These additional impacts include increase velocities, erosion, sedimentation, and turbidity, and increased stream temperatures in the summer.

4-421 2nd bullet, 1st sentence: The requirement that a storm system be present in order for pollutants to negatively affect water quality needs to be substantiated. Sheet flow into a water body from adjacent developed property can and does contribute to water quality degradation of that water body.

4-421 Non-effective Impervious Surface: The determination that columns and guideways will not be considered effective impervious surfaces because there presence will not increase the rate or volume of stormwater runoff to the receiving system above existing conditions is not accurate. These structures may change the rate and concentration of stormwater flow therefore may impact the CSOs and other discharge points. An analysis of the rate and concentration of stormwater flow from these structures is required to determine the impacts of this change on CSOs and other stormwater discharge points. Mitigation should be identified for these impacts.

4-421 The footprint of the columns will be considered impervious surface.

4-421, 4-439 4.14.2.3 Surface Water Quantity Impacts, Paragraphs on Effective & Non-Effective Impervious surface and 4.14.4 Mitigation. Analysis of the impacts of dewatering activities and mitigation measures is not adequate. Non-effective impervious surfaces compared to effective impervious surface still generate runoff, but at a reduced rate; therefore, runoff contribution from these surfaces to existing drainage channels or conveyance system must be accounted for in the capacity analysis using a conservative method.

4-421 2nd paragraph, 1st sentence: Add "as defined by the Department of Ecology" after "...can be divided into two categories". Also, the City's drainage code is not based on Ecology's definitions of effective impervious surfaces and non-effective impervious surfaces and does not use them to determine what areas require mitigation. (Also applies to 2nd bullet, 2nd paragraph; page 4.425. 5th paragraph, 3rd sentence.)

4-421 1st bullet, last sentence: Comment: Statement is true but the City's drainage code is not based on what components are hydrologically important or not. Please refer to the Code for triggering conditions.

4-421 Last paragraph, last sentence: A number of studies have shown that water quality degradation occurs when there's as little as 10-15% development in a watershed.

4-423 Provide calculation of how Alternative 4.2 will have a 4 percent increase in impervious surface.

4-424 and 425 6th Paragraph. Longfellow Creek requires a 50-ft buffer in which no development is allowed. Exceptions to this requirement are not as described. Refer to SMC 25.09.

4-425 Last paragraph: Comment: If this project is required to construct a new drainage outfall, it is the City's experience that this takes a significant amount of time and resources to design and acquire permits from various agencies. The City will require a drainage plan to be developed showing the discharge location during the design phase.

4-427 through 432 Tables 4.14-9 through 25 Why are the bolded stations not the same as those in Tables 4.14-3 through 8?

4-433 5th bullet: Add "City" after "..designated receiving water may be exempt from ". Ecology may impose detention requirements.

4-434 5th paragraph, 1st sentence: Shouldn't it read "..could provide a water quantity (not quality) benefit…"? Not sure why the examples of WSDOT's HPA permits were included.

4-434 First and Second Bulleted Paragraphs: If the project has 5,000 square feet or more of new or 1 acre of accumulated new and replaced (down to the earth) impervious surface, stormwater treatment may be required regardless even if it drains to a designated receiving water body depending on the impacts. (See General Comment #3). Credits and net amount of impervious surfaces are not allowed in determining whether water quality treatments will be required. If the project has 2,000 square feet of new and/or replaced (removed down to earth) impervious surface, then detention will be required even if it discharges to a combined system. The impervious surface created by the total project will be used when determining the stormwater requirements.

4-439 1st paragraph, 2nd sentence: Depending on where the discharge point(s) are, there may or may not be adverse impacts. For example, if the bridge deck generates pollutants that

are washed into the receiving water bodies, there may be adverse impacts. Again, the City's code is not based on Ecology's definitions of Effective and Non-Effective impervious surfaces. The project shall comply with the City's code.

4-439 4.14.7. Given outstanding questions related to the impacts of pollutant runoff from the bridge crossings, it is premature to make a SEPA determination of significance regarding water quality impacts. The City will need to examine additional data requested in the above comments before agreeing with whether or not there is a significant adverse impact.

4-440 4.15.1 Longfellow Creek: Description inadequate and incorrect. The reference to the Dragonfly Pavilion, not yet built, as a landmark and geographic locator should be replaced with an existing landmark. The document should state that this is a 5.65 acre Greenspace with riparian and upland areas from SW Andover to SW Genesee.

4-450 There are 2 Zelcova serrata trees on the Seattle Center campus and none of them would be near any of the monorail proposed routes through the campus.

4-453 3rd Paragraph. The sentence regarding the observed eagles perched on the large Sequoias should be attributed to Seattle Center Staff, not Glowacki.

4-459 It should be noted that moving trees is an expensive mitigation option. Based on recent Seattle Center experience, the cost of moving a 6"-8" caliper tree within the Seattle Center grounds is between $500 - $800. Trees that are 8" - 15" caliper cost from $800 - $5000 to move. Trees 16" - 18" are $5000 - $10,000 per tree. A tree over 20" in caliper would be a minimum of $20,000 and potentially much more.

4-458 Many sq. ft of shrub beds, ground covers and lawns, as well as trees will be removed or impacted primarily by the 3.1 route. The cost of replacing these plantings is significant. For example, the cost of planting a 10'x10' area from the ground up with shrubs , perennials and ground covers can easily cost up to $1000 just for plants and labor. This assumes that the infrastructure, such as soil, irrigation system, landscape rocks, etc is still in place. If the infrastructure has been demolished then the cost will be much higher. The cost of replacing lawn is .35 per sq. ft. Any lawn area impacted by construction should be protected if possible and/or replaced after construction at cost to the contractor or project.

Plants & Animals

General All figures that illustrate "Segment 6: West Seattle" appear to be incorrect: the alignment of 6.1 and 6.2 to the west of the Delridge stations appears to be incorrectly shown and labeled. Alignment 6.2 should be paired with Delridge 2 and so forth. This mistake appears throughout the document and engenders a great deal of confusion. As a result, all references in the EIS to alignment alternative numbering in West Seattle and all comments here related to alignment alternative numbering in West Seattle should be carefully reviewed for accuracy.

4-440 2nd Paragraph. See comments in water section regarding potential significant impacts of pollutants to the aquatic environment.

4-441 4.15.1.1 Second and Third Paragraphs. Include adult salmonids as fish that use the aquatic habitats.

4-442 2nd Paragraph. Include the reference for this information

4-444 2nd Paragraph. Include that the Duwamish River is also an important route for adult salmon.

4-444 6th Paragraph. Include the name of the fish biologist.

4-444 6th Paragraph. Include reference for information on the absence of forage fish spawning habitat.

4-446 Last sentence of second paragraph: The following "land use in the segment between the culvert intake at SW Andover and SW Genesee Streets is predominantly scattered residential and industrial" is misleading. It does not recognize the existence of a 5.65 acre open space area.

4-446 Third Paragraph: Correction: Although Seattle Public Utilities (SPU) did not begin conducting formal spawning surveys in Longfellow Creek until 1999, approximately 44 adult Coho salmon (live and dead) were observed in the creek downstream of SW Genesee Street. Spawning surveys conducted by Washington Trout under contract to SPU resulted in the following counts of adult Coho carcasses: 92 in 1999, 282 in 2000, 270 in 2001, and 166 in 2002, and in the following counts of adult chum carcasses: 67 in 2001 and 21 in 2002 (Katherine Lynch, Urban Creeks Biologist, SPU, personal communication). Comparisons of daily and weekly spawning survey counts have demonstrated that some of carcasses are overlooked and thus the creek likely has counts of substantially more fish.

4-447 There is one Sequoia sempervirons and one Metasequoia glyptostroboides north of Key Arena near Mercer St. that have been observed as eagle perches by Seattle Center staff.

4-448 Table 4.15-4. Include status of the species according to WDFW Priority Habitat and Species information.

4-449 1st Paragraph. Provide source for the wetlands information.

4-452 Endangered Species Act Listed Species Section. Addition. There has been a record of one redd produced by a spawning pair of Chinook in Longfellow Creek in 2001 (Katherine Lynch, Urban Creeks Biologist, SPU, personal communication).

4-454 4.15.2.1 Operation Impacts, 3rd Sentence. The monorail will be contributing heavy metals, hydrocarbons and grease into the environment therefore it shouldn't be classified as a non-pollutant-generating mode of transportation.

4-456 Operational impacts at Seattle Center may include extensive cleaning and bird control measures under the guideways if these structures have roosting potential for birds such as pigeons. Given this, potential mitigation measures could include installation of acceptable bird repellents and financial contributions towards the cost of cleaning.

4-456 Section 4.15.3.3 last paragraph on page. "Operation of the Green Line Alternative 6.1.2 would require control of the vegetation height under the guideway". However, it would also require removal of some trees during construction (assuming all vegetation within 50 feet on either side of the Green Line alignment centerline would be removed by construction.) This is not addressed.

4-457 4.15.3 Mitigation. Change "may" to "will" in first sentence and remove "likely" from the 3rd sentence.

4-457 4.15.3.1. Change "could" to "would" in first sentence and remove "minor" from last sentence. The impacts of the structures has a good potential to be significant because of the increase in bass habitat which can lead to an increase in predation on juvenile Chinook salmon.

4-457 States "Assuming all vegetation within 50 feet on either side of the Green Line alignment centerline would be removed by construction activities…." Does this apply along entire line? If so, are more trees likely to be removed or pruned?

4-459 4.15.4. Significant Unavoidable Adverse Impacts are likely to occur from the permanent structures that are proposed in the Ship Canal. This is a highly degraded environment with anadromous fish that use this area as a migration route to and from their spawning habitat. An increase in habitat for predator species of these anadromous fish can be considered significant. A more detailed analysis of these impacts will be needed

Cumulative Impacts

4-464 1st full paragraph. The Weller/King Street Station example cited in this paragraph does not exhibit lost parking supply/increased parking demand discussed earlier in the paragraph. This should be clarified.

4-464 The example of Westlake Station and Weller Street Station in the first full paragraph only illustrates increased pedestrian activity, not the other cumulative impacts discussed earlier in the paragraph. This should be clarified.

4-464 The Alaskan Way Viaduct and Seawall Project might displace 500-700 on-street parking stalls, which is more than "some parking". The Downtown monorail segment has identified on-street parking losses within a range of 122-236 spaces (along 2nd Ave and Stewart St). Cumulatively, this is a significant impact (in fact, the Transportation Section determined this to be a Significant Unavoidable Impact) from both parking capacity and city revenue perspectives.

4-465 Statement is made that cumulative land use impacts are not expected in West Seattle because of the relatively small number of projects planned for that segment. However, on page 464, mention is made of a substantial number of private development projects in West Seattle as potentially leading to "impacts from higher ridership." Please clarify.

4-469 Cumulative Impacts of No Action Alternative: The discussion of the No Action Alternative's impact on achievement of the regional growth strategy should focus on impacts to the neighborhoods served by the Green Line and the region's connections to/from those neighborhoods, since other funded public transportation projects serve other areas of the region.

Construction

General Sidewalk widening along the route must comply with ADAAG slopes, and City of Seattle standards, typically 2%. This has elevation impacts to private properties and/or drainage function impacts.

General Please note that new utilities have been installed along several streets along the alignment that do not show up in "underground utility drawings for all EIS alternatives", dated June 12, 2003.

4-471 2nd paragraph: "where 24 hour construction…additional conditions or permitting requirements could apply" Change "could" to "would."

4-473 Seattle Center has an extensive irrigation system that will be impacted by any of the routes going through the campus. Virtually all landscaped areas and lawns are served by an in-ground automated centrally controlled system (Maxicom). Double-check valves, zone valves, mainline and lateral pipes, sprinkler heads, valve wires and the Maxicom communication wire must be protected in place or relocated if they fall within the construction zone. If construction is to occur during the growing season, irrigation must be kept operational adjacent to the construction zone.

4-473 "Stage 1 – Move Utilities and Clear Foundation Sites
The DEIS states that "Utilities that encroach on the utility clearance requirements would be relocated underground or to an overhead location elsewhere in the right-of-way." Replace with: "In areas where the monorail structure will encroach on the required clearance to a utility, the utility shall be relocated underground, vertically in the location, or re-aligned in the same right-of-way."

4-474 Stages 2, 3, and 4 – Column Foundations
Hand digging and vac-truck may be required next to 14.4 kV network ducts and vaults, until the facilities have been passed.

4-474 Stages 2, 3, and 4 - column foundations: There is no mitigation proposed for erosion from auger spoils that will be temporarily deposited on the surface during construction especially during the wet weather season.

4-474 "Pile driving would be a source of noise and vibration…" Further information is required on the effect of vibration on existing utilities and structures before approval of pile driving is given. Please provide information on the specific amount of vibration that is expected, its affect on utilities and structures.

4-476 "Stage 6 – Guideway Beam Installation
The guide beam should maintain clearance from overhead power during installation. Lay-down plans shall be put in place that shows the sequence of work to show that it is possible to position the beam without violating construction clearances."

4-478 4.17.1.5 Bridge drains will be an issue depending on track location. Downspouts may have to be retrofitted with Catch Basins or other BMPs.

4-479 Some of the existing trees have very high historic and monetary value to the neighborhood. The impact of tree removal needs to be discussed further. SMP must consider other mitigation that would allow for protecting the trees during construction.

4-482 The DEIS states "In Downtown Seattle, SMP will coordinate with the City of Seattle on special events, holiday construction, and other activities." It should state, "In Downtown Seattle, and around the Seattle Center…"

4-482 There are no mitigation measures listed at the end of table 4.17-2 regarding impacts from listed construction sequencing, installation of columns and temporary use of staging areas.

4-485 Discussion of impacts should include impacts to pedestrian movements on Seattle Center campus with Alts 3.1 and 3.3.

4-485 There is no mention of the construction impacts of demolition of the existing monorail.

4-485 Segment 3, paragraph 1, remove "heavy" and replace with "within the ROW", and change "hour" to "hours". This is a global comment for all segments.

4-487 Text indicates closed travel lanes in the area of the West Seattle Stadium. These impacts to access should be identified here.

4-489 Bullet 13 - SMP should commit to "identify and implement" measures to reduce the need of street parking by construction workers ..."

4-488-490, 4-496, 4-500 4.17.2.2 Detailed Construction Management Plan (CMP), to schedule monthly meetings for the duration of the project. Attendees: SMP, all pertinent city agencies, contractor and the neighborhood. Have a "construction" telephone hotline with a live person answering calls, newsletter with construction schedule for upcoming month. CMP would be for all construction mitigation sections. (Also applies to p. 4-496, 4.17.5.2 and page 4-500 4.17.8.1.)

4-489 Ordinance 119975 (the Sound Transit Transitway agreement) contains a number of construction mitigation items that should be implemented by SMP as well. Among those items are: "developing a multi-media public information program to provide information regarding street closures, hours of construction, business access, and parking impacts; working with affected business owners, chambers of commerce, merchants associations and others to develop a business-marketing program to minimize business disruption during construction. The program could include a shuttle bus and/or increased transit service to affected areas, additional signage, advertising and promotion, and incentives to attract and retain customers."

4-489 Last line. Change "6:30 AM" to "6:00 AM"

4-494 The DEIS states "Construction timing for both through Seattle Center alternatives (3.1 and 3.3) is a concern because of the many performance venues in the Center." It should be "Construction timing for all Seattle Center alternatives…"

4-495 4.17.5.1: Economics - Impacts: (end of first paragraph under impacts) Please state positively whether mitigation of the loss of parking will be needed and will be provided.

4-495 4.17.5.1: Impacts, second paragraph: Please provide more specificity about potential loss of jobs and revenue to local businesses.

4-496 4.17.5.2: Please either state mitigation in positive terms (change "could" to would) or identify the impacts as not able to be addressed by mitigation.

4-496 The DEIS mentions a shuttle bus as potential mitigation; the FEIS should identify specific mitigation measures proposed to address the interim period when no monorail service is operational along the current route.

4-496 4.17.4: There is no mention of responsible party for permit negotiations such as NPDES construction permits that may be required for some sites in the mitigation section.

4-498 Are there any sensitive air quality receptors located near construction sites?

4-498 Potential impacts associated with changes in traffic patterns and how it affects air quality due to construction needs to be analyzed especially on heavily congested intersections and roadways.

4-498 Need to discuss how vehicular emissions and fugitive dust effect human health.

4-500 4.17.8.2 Vibration Impacts and Mitigation; Impacts. Bottom of page. The document states that at the highest level, buildings respond to vibration with slight damage. "Slight damage" is not defined. Significant damage can occur to structures from construction related impacts, including structural damage, and architectural damage to finishes. Historic and older landmark structures are even more sensitive. Much lower vibration levels will cause extensive damage to these sensitive structures than newer structures. The EIS should indicate that significant foundation and architectural damage can occur due to construction- related vibration, and these adverse impacts must be mitigated.

4-500 Section 4.17.8.2; Other non-building structures should be added as another category. Older lead joint watermains and clay sewer pipes can develop leaks or cracks from excessive vibration. Watermains and sewers supported by pile foundations in poor soil areas can settle and shift due to excessive vibrations. These impacts were not addressed in the vibration section.

4-500 4.17.8.2 Soil test borings collected for SMP should be reviewed for subsurface conditions, once the study by Shannon and Wilson is completed and available. A case-by-case review of vibration sensitive structures should be conducted using the results of the soils report. This requirement should be included in the text of the DEIS.

4-501 4.17.8.2 Vibration Impacts and Mitigation; Impacts. Middle of page. What is the reference for damage threshold for fragile buildings? One useful reference concerning this issue is "Vibration Criteria for Historic Buildings," by Walter Konon and John R. Schuring, ASCE, 1983. This reference includes a damage threshold relationship between peak particle velocity in inches/second as related to frequency in Hz. The damage threshold for frequencies up to 10 Hz for transient vibrations (like an impact pile hammer) is as low as 0.25 inches per second. The damage threshold for steady state vibrations (like a vibratory hammer) is 0.12 inches per second for the low frequencies. Higher frequencies associated with vibratory hammers have a damage vibration threshold ranging from 0.12 inches per second to 0.25 inches per second. Vibration values no higher than these should be the limiting values in the EIS, based on the results of this study.

4-501 Vibration levels related to construction activity are discussed in the DEIS in units of RMS velocity levels in VdB re 1 micro inch/sec. The EIS needs to provide a conversion between this unit and the commonly used unit of "inches/second" with which vibration is often measured in terms of peak particle velocity. Without a conversion, or a supporting appendix, it is difficult to navigate this section and the numbers are not meaningful.

4-501 4.17.8.2 Vibration Impacts and Mitigation; Impacts. Last paragraph. The DEIS does not indicate that the vibration damage threshold for steady state vibrations such as generated from a vibratory pile hammer is less than for transient vibration such as for an impact hammer.

4-501 4.17.8.2 Vibration Impacts and Mitigation; Impacts. Table 4.17-5. The source of these values for various construction equipment is not provided or referenced.

4-502 4.17.8.2 Vibration Impacts and Mitigation; Mitigation. 2nd paragraph. The DEIS indicated that "...a vibration monitoring program could be implemented for all activities that produce vibration levels at or above 0.5 inch per second wherever there are sensitive structures located closer than 25 feet from the construction activity." The vibration level specified may not be sufficient to prevent adverse impacts to an historic structure. Vibration levels as low as 0.12 inches per second could result in damage.

4-502 4.17.8.2 Vibration Impacts and Mitigation; Impacts. Second to last paragraph in this section. The DEIS does not indicate that damage to utilities, including cumulative impacts through the years, is difficult to assess and hard to detect since they are buried and cannot be easily visually inspected. It is not clear what the document refers to as "vibration impact damage." As a mitigation option SMP must document existing conditions of sensitive utilities prior to start of work within zone of influence.

4-511 4.17.8.2 Vibration Impacts and Mitigation; Mitigation. The DEIS indicates that "If the use of pile driving is necessary near very sensitive buildings, additional soils information and vibration testimony could be gathered to establish the site-specific estimate of vibration levels." It is not clear why pile driving would be necessary in close proximity to very sensitive buildings. This paragraph also indicates that vibratory hammers should be considered where vibration levels are near damage thresholds; however, no distinction is made to lower damage threshold associated with vibratory hammers. Also, other construction equipment capable of generating significant vibrations, such as hoepacks, were not mentioned.

4-511 4.17-6 The second paragraph on this page has a list of possible mitigation measures for vibration during various activities; none mentioned the removal and demolition of concrete pavement with "hoe rams" or other types of impact equipment. Since there is no data from core samples, it would be difficult to know how thick the paved area is and what level of vibration will occur when the demolition takes place.

4-511 4-17.10.2 Vibration mitigation measures - Add pre-drill driven piles in compact "crust" over soft soil.

4-512 4.17.10 general - SPU is responsible for the Heath and Safety of the water system as it related to public health as mandated by City ordinance and Washington State Department of Health. The contractor shall not damage, repair, alter, dismantle or operate any SPU owned water mains, services, valves or hydrants. This includes water services, fire services and hydrants. If any portion of the water utility is damaged construction, call the 24 hour dispatch line at 206-386-1800. Contractor shall not operate or perform repairs to the SPU owned water system.

4-512 4.17.10.2 - First paragraph - second sentence comment - Exact locations and depths of utilities shall be verified by SMP. Impacts to SPU facilities and associated costs will be verified by SPU based on SMP supplied plans and supplemented information during the design stage.

4-513 4.17.10.2 First paragraph - third sentence should be modified to say: "During the final design phase, construction methods and BMP would be developed by SMP and the DBOM contractor in consultation with and final acceptance of the utility purveyors. Waiting for the final design to determine construction methods could delay the project if incorrectly designed. The specific utility approved plan shall take into account spacing and protections measures specific to each site to reduce customer outages and prevent lack of access, damage to facilities, settlement, vibration over threshold, and avoid dewatering groundwater and hazardous materials."

4-513 4.17.10.2 Third paragraph - fourth sentence "All underground utility relocations share…" add the word "vibration." In addition, the ripple effect by moving other impacted utilities needs to be included.

4-513 4.17.10.2 Fourth paragraph - third sentence. Add bold text as follows: "Determination of acceptable new locations of SPU facilities shall be coordinated with and approved by SPU."

4-513 4.17.10.2 Fourth paragraph - sixth sentence should be modified to read "Trenches over four feet in depth required shoring to ensure working safety per Washington Industrial Safety and Health Act regulations and shall be designed to protect utilities within the zone of influence.

4-514 Table 4.17-8 general note 5 - Where watermains are replaced or relocated it is very likely that water services, hydrants and appurtenances will also need to be replaced or relocated. In addition additional appurtenances such as hydrants or water services may be need to be relocated due to conflict.

4-514 Table 4.17-8 general note 6 - fire hydrant and service location may also be affected by column placement.

4-514 Table 4.17-8 General comments: The potential impacts of the project lengths and services affected were not verified. The actual length and number of services affected will be determined when actual plans for alignment and column placement are developed. Also, this table does not take into account the possibility of utilities being affected by the "ripple affect" by other utilities moving into the vicinity.

4-517 First paragraph - second sentence "in some cases…." The DBOM contractor shall not "damage, repair, alter, dismantle, modify, or operate any SPU water facilities. In the event of damage call the 24 hour dispatch line at 206-386-1800.

4-517 Repeat - First paragraph - fifth sentence should be modified to read "The relocation would be reviewed and approved by the utility purveyor…"

4-517 Repeat with modification - First sentence "Existing underground utility service connections……" Extending or shortening the underground utility service may not always be feasible to retain a connection to the relocated main, specially for gravity-only utilities. For the water system, the existing material would be factored in. Only a perpendicular straight line is allowed from the water appurtenance to the watermain. If a new watermain is installed, the existing services would not be reused.

4-530 Typical Potential Mitigation Measures, second bullet. Change to read "Continue to meet with and coordinate closely with both municipal and private utilities to reduce impacts. As part of long range planning, develop a plan for relocation and construction sequencing acceptable to the utilities and design protection of their facilities into the column foundation design that will allow the utility to access to adjacent facilities. Note: if utility relocation requires a service connection to move - It is SMP's responsibility to coordinate any service connections on the private portion of the utility being moved with the private property owner. SPU will not work on the private portion of any utility service. Before any relocation, SPU will verify this coordination has taken place between SMP and the private property owner.

4-530 Typical Potential Mitigation Measures, fourth bullet. Change to read "Conform to the most current edition of the City of Seattle Plans and Specifications for new utility construction.

4-530 Typical Potential Mitigation Measures, fifth bullet. Comment: Notification of outages will be done by SPU per City ordinance and will conform to existing guidelines, criteria and City of Seattle Standards.

4-531 Typical Potential Mitigation Measures, Eighth bullet. Comment - potholing may also be needed of other surrounding utilities to develop a utility relocation plan for a specific site.

4-531 Typical Potential Mitigation Measures, Tenth bullet. Comment - delivery inadvertent, all damage to any part of the SPU owned system will be repaired by SPU, not the contractor. If damage to SPU water facilities occur, contractor must call one call 206-386-1800, Contractor is not allowed to repair, modify, change, or operate any component of the SPU water system.

4-531 Typical Potential Mitigation Measures, Thirteenth bullet. Modify bullet to read "Specify protective measures, such as pipe and conduit support system, trench sheeting, vibration monitoring and protective shoring during construction to minimize or avoid potential damage to all utilities within the zone of influence."

4-531 Typical Potential Mitigation Measures, add bullet "design monorail foundations to allow for trenching next to column to access utilities without special considerations being taken by the affected utility."

4-531 Typical Potential Mitigation Measures, add bullet "Long range planning shall include mitigation for garbage pickup within the construction zones and detours"

4-531 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains add garbage service.

4-531 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains - fourth bullet. Comment depending upon soil conditions and/or construction activities, cast-iron lead-joint water mains may need to be replaced outside the 10' protection zone. The specific locations will be determined as more specific information becomes available.

4-531 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains - sixth bullet. Comment: This comment needs to be split because there are two issues at hand. First, SPU is responsible for water pressure and supply. The second issue is fire suppression and life safety, there may be other mitigation measure imposed by the fire department outside the water supply arena. This will require working with the fire department and private property owners to come up with mitigation measures to protect life safety. While the two are similar, they are two completely separate issues.

4-531 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains - seventh bullet. Modify to read "Comply with...(during construction), and the most current City of Seattle Standard Plans and specifications.

4-531 Typical Potential Mitigation Measures, Seventh bullet. Change to read " As a portion of long range planning, SMP will develop in coordination with SPU a general utility relocation and protection polices and procedures that is acceptable to the utility. Delete: "Seattle Utility Coordinating Committee and similar entities." The utility coordinating committee is in an advisory capacity only.

4-532 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains - eighth bullet. Comment - As part of long range planning SPU will determine water services affected by displacement of residences or businesses. Any modification of private property utilities must be coordinated by SMP with the property owners, as per City of Seattle Ordinance. In general, SPU water is responsible to the property line or the city union which may be far from the property line in some cases due to site specific complications like a rockeries or walls.

4-532 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains - ninth bullet. Comment - Under no circumstances is the contractor to damage, repair, modify or operate any portion of the water system including but not limited to water services, water mains, valves, test stations, and meters.

4-532 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains - tenth bullet. Comment - SMP does not have any role in the maintenance of water supply for emergency service purposes. If the water utility is damaged, the contractor must call the 24 hours emergency dispatch at 206-386-1800.

4-532 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains - eleventh bullet. Modify bullet to read "Engineer new water, sewer and storm system as appropriate and consistent with current City of Seattle Standard Plans and Specifications." . Where ductile iron pipe is to be installed for the water utility, soil conditions must be analyzed to determine if the pipe needs to be wrapped.

4-532 Potential Mitigation Measures - Develop agreements for least encumbering arrangement for maintenance involving digging near monorail foundations and guideways.

4-533 Text reports that "Use of the stadium facility and access to it would not be affected." but page 4-487 and 4-495 indicate otherwise by describing construction impacts. This inconsistency should be corrected.

4-533 Last paragraph: measures "normally required as conditions for permit approval" cannot be considered as mitigation.

4-533 Last paragraph. The text reads "erosion control and mitigation and revegetation". Use of the words "and mitigation" is unclear. The sentence should be clarified.

4-533 Last paragraph. The text reads "erosion control and mitigation and revegetation". Use of the words "and mitigation" is unclear. The sentence should be clarified.

4-542 In the downtown corridor, and historic preservation areas retention of existing granite curbs may be required.

4-542 The design for extension of sidewalk should incorporate existing decorative sidewalk design and must have the overview of the Seattle Design Commission.

4-543 "Additional mitigation measures that may be employed include modifying the drilling or construction technique, installing recharge wells, and adding support to adjacent structures." Installing recharge wells would not help in mitigating damage or settlement due to vibration from driving piles. However, installing recharge wells could help in mitigating affects from dewatering.

4-543 4.17.14.1 Impacts; Construction-Related Excavations. The document indicates that difficult excavations of well-consolidated geologic units may require blasting. No blasting will be allowed for excavation. Commonly available construction equipment will be able to excavate through the soil units associated with this project.

4-543 4.17.14.2 Mitigation. Third paragraph. This section indicates that vibration could be reduced by using vibratory pile drivers. However, damage threshold for steady state vibrations associated with vibratory hammers is less than for impact hammers. This difference in damage thresholds needs to be considered in developing mitigation plans.

4-543 4.17.14.1 Impacts; Construction period erosion. A reference of "Griswold, 2003" was cited. The reference is listed as personal communication with Dean Griswold. However, there have been no personal communications between SMP and Dean Griswold relating to this issue. The City of Seattle provided a written comment in review of PDEIS for the Monorail project. This reference should be removed.

4-558 A tree protection plan for trees that will remain in proximity to the guideway construction needs to be developed and implemented by a qualified, certified arborist. This is a standard requirement for all major construction projects that occur on Seattle Center grounds. Provisions should be written into construction contracts that penalize, monetarily, any construction firm that damages trees designated to be preserved and protected during construction. Designers and contractors must work with Seattle Center landscape and project management staff to enforce tree protection guidelines and to adapt construction objectives to minimize damage to trees growing in the construction zone.

4-558 All trees to be impacted by any route through Seattle Center should be appraised for their value before construction begins. The appraisal procedures should be those set up by the Council of Tree and Landscape Appraisers. This system is endorsed and utilized by the American Association of Nurserymen, American Society of Consulting Arborists, Association of Landscape Contractors of America, International Society of Arboriculture and the National Arborist Association. A consulting, certified arborist should be contracted to do this work. Based on values established by these appraisals, Seattle Center should be compensated for the loss of these trees and the cost of the appraisal work. The appraised value for a few trees impacted by the 3.1 route has been done for other projects on Seattle Center grounds. For example, the trees along the north and south sides of Republican St., between 3rd Ave and Memorial Stadium were appraised before the McCaw Hall project began. The appraised values range from $1300 for a Honey Locust to more than $10,000 for one of the larger London Plane trees.

4-558 Vibration and noise created by pile driving will impact fish in the ship canal. Mitigation measures such as air bubble curtains will be required during pile driving.

Appendix A - Environmental Justice

A-11 Concerning Indian tribes, the DEIS says "…No specific concerns have been raised so far...Typical areas of concern for tribes are potential impacts to water quality and fisheries. Impacts to these resources would most likely occur where the Green Line crosses the Ship Canal…." The only reference is to the Ship Canal. It should be stated that potential construction impacts related to environmental health, water, plants and animals may also occur in connection with the proposed Delridge location for the Green Line i.e. particularly disturbance of contaminated soils and release to ground or surface water. This may affect tribal fisheries at the mouth of Longfellow Creek, at the West Waterway of the Duwamish River at Terminal 5. (Documentation of the tribal fishery is through personal communication with George Blomberg, Port of Seattle.)

Appendix H – References

The document, "Phase I Environmental Site assessment, Proposed Open space, Longfellow Creek Natural Area, Seattle, WA," May 12, 1994 for the City of Seattle, prepared by GeoEngineers was given by SPU/Parks staff person Sheryl Shapiro to Parametrix and Monorail staff for review concerning environmental health and water issues. This report discusses the research and findings of parcels adjacent to the proposed Delridge alignment and stations. It is not listed in the reference section nor cited in the Chapters on these areas. Of particular note are pages 16

and 17 that state "...it is our opinion that the site has residual concentrations of regulated substances in concentrations exceeding MTCA cleanup levels." We recommend taking a close look at this document to see if it has information that should be further analyzed and incorporated into the EIS. Copies are available.

Appendix I - Projects to Consider for Cumulative Impact Analysis

I-1 The AWVSRP draft EIS, due out in March 2004, will describe five alternatives as well as a no action alternative. Construction schedules assume major work to begin in 2008, although funding has not been confirmed. We recommend that you modify the description of the AWVSRP in this section of your EIS in two details. First, the parenthetical at line 12 of the paragraph should read, "combinations of at-grade, aerial and tunnel routes." Second, the sentence beginning, "Plans for…" in line 14 should be replaced with, "Plans for the project currently include refitting the Battery Street Tunnel for fire and life safety improvements, which together with reconstruction of the AWV will require use of detours on Downtown Seattle surface streets. Depending on the alternative selected, Broad Street and Alaskan Way will see the heaviest impacts."

The Alaska Way Viaduct and Seawall Project (AWVSRP) plans to include work on Aurora Avenue North (SR 99) and some adjacent streets in the segment from Denny Way to Roy Street. Some features of the different options currently under consideration are as follows:

<u>Widened Mercer</u>
- Thomas Street would be reconnected with an overpass over Aurora and improved as far west as 5th Avenue North.
- Mercer Street as far west as 5th Avenue North would be restored to two directions and expanded to a total of seven lanes.
- Broad Street would be abolished and backfilled from Thomas Street to Dexter Avenue North.

<u>Lowered Aurora</u>
- Aurora would be lowered from John Street to Ward Street.
- Thomas, Harrison, Republican and Roy Streets would be reconnected with overpasses over Aurora.
- Mercer would be widened, restored to two directions and routed on an overpass over Aurora.
- Broad would be abolished and backfilled from Thomas to Dexter.

<u>Existing Mercer Underpass</u>
- Thomas would be reconnected with an overpass over Aurora and the south side of the intersection with 5th Avenue would be improved.
- Broad Street would be abolished and backfilled from Thomas to Dexter.
- Traffic signals would be installed along Aurora at crossings with Thomas, Harrison, Republican and Roy Streets.

The western construction limit for all of these options is the east side of 5th Avenue. This would be adjacent to a monorail guideway running in the middle of 5th Avenue. It would overlap guideway and stations on the east of 5th from Mercer to Thomas. The potential Vine Street pocket track lies in this general vicinity, too. These interferences do not necessarily invalidate any Green Line alternatives, but the plans of the two projects should be coordinated here in detail. Furthermore, current schedules contemplate AWVSRP construction to take place in this area as early as 2008 and 2009, which overlaps with the Green Line construction window of 2005-2009. Simultaneous construction activities might impact each other and accumulate impacts in the neighborhood and surrounding streets. (Also see 3-30 to 3-33.)

The DEIS states that in SODO the Green Line would run along South Horton Street to cross the Burlington Northern Santa Fe (BNSF) tracks and SR 99. Spokane Street is the southern limit of alternatives currently under consideration for the AWVSRP. No changes are under consideration for the AWV itself in the vicinity of Horton, but there are potential changes to the rail crossings. One of the options under consideration by the AWVSRP involves relocating the Burlington Northern Santa Fe SIG rail yard to the south. This shift would increase the number of places rail tracks cross South Horton Street between First Avenue South and East Marginal Way. Plans for the Green Line structure (e.g. pier locations) along Horton Street should take this possibility into account. (Also see 3-38 and 3-85)

Parking impacts of the AWVSRP vary among alternatives under consideration. In City neighborhoods ranging from the Stadiums to the North Waterfront, the AWVSRP could permanently eliminate totals of up to 1000 on-street and 120 off-street parking spaces. During major AWVSRP construction (currently projected for 2008-2015), the total temporary loss could be up to 2400 spaces, though this may be mitigated by shuttle arrangements from existing out-of-area parking or by construction of new parking structures by the AWVSRP or by private interests. (Also see 4-61 and 4-464.)

The 2005-2009 timeframe planned for the Monorail Green Line overlaps the 2008-2015 major construction period contemplated for the AWVSRP. Each project will be phased, and each is susceptible to delays. It is possible that Green Line construction will be complete before AWVSRP work begins. Nevertheless, the two project teams must coordinate in order to minimize potential interferences and overlaps between their activities and impacts, particularly along 5th Avenue North on the east side of Seattle Center and in downtown. (Also see 4-470)

During the time that segments of the AWV and Battery Street Tunnel are being reconstructed, SR 99 traffic will be rerouted. A leading option would send two lanes of southbound SR 99 traffic west on Broad Street (the closure of Broad Street described above would happen afterwards) to a temporary overpass connecting with Alaska Way for a period of some seven years, currently to start in 2008. Furthermore, temporary closure of the AWV ramps at Western and Elliott Streets might require northbound AWV traffic destined for Belltown, Magnolia and Interbay to remain on SR 99 through the Battery Street Tunnel before exiting and continuing to these destinations on surface streets. Both temporary and permanent impacts to traffic in the area of Seattle Center from the Monorail Green Line need to be coordinated with those of the AWVSRP. (Also see 4-60 and 4-485.)

AWVSRP diversions and delays will tend to increase traffic on parallel downtown arteries, to include 2nd Avenue, where the Green Line construction and alignment is planned. (Also see 4-485.)

Planning for the AWVSRP commits to maintaining at least two lanes each way on SR 99 and at least one way each way on Alaskan Way through the duration of construction, but detours and narrowing could degrade their usefulness as construction access routes for the Green Line project. (Also see 4-486.)

I-2 Viaduct discussion related to Aurora should be changed from "reconnect the street grid system over Aurora Avenue in the Seattle Center area." to "connect some streets across Aurora Avenue in the Seattle Center area, including a widened, two-way Mercer Street between Dexter and Fifth Avenue North."

I-2 Concerning the I-90 Two-Way Transit and HOV Operations Project, funding has only been identified through final design. Some construction funding has been identified, but there's still potentially a $60-100 million shortfall.

I-5 City of Seattle: South Lake Union Improvements - add a new sentence after the sentence re Mercer Street (the first sentence below) "The City is considering a widened, two-way Mercer Street as the major connector between I-5 and Aurora Avenue and a narrower, two-way Valley Street that provides a pedestrian-friendly environment along the south edge of South Lake Union Park. {new sentence --->} With changes under consideration for the Alaskan Way Viaduct Replacement Project, the two-way Mercer Street would extend west to Fifth Avenue North." In addition to a two-way Mercer option, improvements to the existing Mercer - Valley couplet will also be examined in an upcoming EIS. The Design and Environmental Review is expected to occur in 2004 and 2005.

I-5 Under City of Seattle: South Lake Union Improvements,
A street car route is being planned along Westlake Avenue and Valley Street between South Lake Union and Downtown Seattle. ADD: "Pending funding, design would start in 2004, with construction in 2005. Design and environmental review will take place in 2003 and 2004.

I-25 Under Seattle Center/QA stations, 3rd paragraph. The Residential (restricted) parking zone in this area should be referenced. The RPZ zone lies northeast of the Seattle Center between Roy St, 5th Ave N, W Aloha St and 1st Ave W--including operating in the evening.

I-25 Last sentence. New parking meters are being installed in areas with time-limit signs now or in unrestricted areas, not where there is no parking allowed now.

I-40 Referring to Safeco Field parking, it should be noted that this parking study was not done on a typical game-day (February 13th). More information from the parking studies from Seahawk Stadium or Safeco Field could be cited to explain what happens with on-street parking during game days.

I-49 "The restricted parking supply is mostly signed, two- or four-hour parking. The restricted zoned parking in this segment limits parking to four hour between 9:00 a.m. and 6:00 p.m." This point would read better if it were combined, such as "the restricted parking supply is mostly signed, two- or four-hour parking between 9:00 a.m. and 6:00 p.m."

Appendix J - Acronyms

J-3 Add OED (City of Seattle, Office of Economic Development)

Appendix K – Glossary

K-7, K8 Add specific Code citations for SEPA view references; for urban center and urban village definitions, refer reader to specific sections and pages of City Comprehensive Plan and Countywide Planning Policies.

Appendix L - Conceptual Design Drawings, EIS Footprint Plans, Draft Cross Sections

Drawing L01-00-01 The double crossover south of Crown Hill station 1 should be moved south or north of the intersection of N 82nd Street in order to minimize shade/shadow impacts at the intersection and cross street.

Drawing L01-10-01 Same comment as for L01-00-01 relative to Crown Hill station 2 - moving the crossover south of N 82nd Street.

L03-00-02, L06-00-04, L03-10-02, L3-10-03, L05-10-03 North arrow is missing on figure.

L-165-166 Interbay Station cross-section: What does the 10.5' combined planter/sidewalk refer to? How wide is the sidewalk? How wide is the planting strip?

L170 - L181 There should be a cross sections showing straddle bents on Mercer.

Drawing EIS-4B-01 Why does the 2nd Avenue Center alignment require cutting across the Bon parking garage site whereas the 2nd Avenue East alignment does not?
multiple Drawing shows storage tracks near John station on Alt 3.1, (page 18) but where are storage tracks for Mercer route, 3.2 (page 53) or Thomas, 3.3 or Denny 3.5 (page 84-88).

Appendix M – Visual Simulations

Figure M-10b The nighttime simulation of the monorail trains shows a headlight beam. If the final design incorporates such lighting, light and glare impacts on adjacent uses must be identified.

Figure M-22 The FEIS should discuss portion of the alignment between West Harrison Street and West Prospect Street in relation to the Elliott Avenue to Puget Sound view corridors as defined in the Seattle Municipal Code section 23.50.026. C.3.

Figure M-34 Alternative 3.1 shows an existing amusement ride with the monorail superimposed over (or through) it. It should be noted on the figure that the existing ride would need to be removed due to its height, with a new ride likely put in its place compatible with the new columns.

Figure M-93 This image is not sufficient to capture the impacts of the monorail on the West Seattle Bridge. The West Seattle Bridge is a SEPA scenic route (25.05.6 80). The visual impacts of the columns and guideway from the bridge should be simulated.

Figure M-100 With respect to visual impacts, the most sensitive area in proximity to Delridge 2 is Longfellow Creek Greenspace. Despite this, the visual simulation shows the station from a direction where the Greenspace is not visible. A new simulation should be developed looking east along SW Andover from a position west of the creek.

Figure M-101 Visual simulation for Avalon 2 shows existing trees that, according to project description, would be removed. The simulation should be corrected to show the station without trees.

Figure M-101 Typically, visual simulations are described as being conservatively large. The Avalon station is known to be approximately 65 feet high. Comparison to adjacent 60-foot tall trees inventoried in Appendix W (page W-10) indicates the simulation shows station to be considerably shorter than 65 feet. Furthermore, based on an informal analysis of perspective construction and the known height of a parking sign in the photograph, the visual simulation shows the building to be no more than 50 feet high. The visual simulation should be corrected to reflect the station massing, insofar as it is known.

Figure M-101 The visual simulation shows no shade impacts. The station will cast a shadow across 35th Ave SW in the am and into West Seattle Stadium athletic fields in the pm. These conditions should be illustrated with a visual simulation.

Cultural Resources - Appendix N

Construction monitoring in additional locations beyond those categorized as "high probability" is recommended. A randomly chosen, statistically defensible sample of those areas with a lesser probability of bearing significant historic or prehistoric deposits (but still viable, based on local depositional history), would allow for both resource protection and future methodological assessment. Sub-surface resources warrant added vigilance based on their extreme vulnerability during construction and the difficulties in planning and protection for this resource type. Where significant intact deposits are preserved, massive impacts to the record due to urbanization make them quite rare. Given the current plan where only high probability areas are monitored (i.e. provided only the minimum level of protection), if resources are found and data recovered, they will add to what we know in areas where some historic or documented information is probably already available. If significant resources come to light in other areas impacted by the Monorail Project, new information will be gained for less well documented land use, and the predictions possible for future work will be further refined. Practice has shown that isolated findings of certain types can be highly significant, and significant findings are frequently encountered in unexpected places.

The following properties determined eligible or listed on the NRHP are not included in table N-3. No reason is given for their exclusion. These properties should be included. B-60, 132, 140. I-25, 26, 52, 66, 72, 73, 1C, 19. SC-8, 13, 16, 22, 31, 32. D-2, 5, 10, 26, 27, 37, 33, 36, 38, 42, 43, 46, 47, 49, 51, 54, 57, 59, 64, 66, 67, 72, 73, 74, 75, 76, 79, 80, 85, 89, 90, 91, 93, 96, 97, 98, 100, 101, 105, 109, 110, 114, 117, 119, 121, 122, 123, 124, 127. S-26. WS-14, 97, 143, 148, 81. These properties should also be included on table 4.17-6. According to the second paragraph under Historical Resources on page 4-534 section 4.17.12.1 Impacts, all of the above resources should be included. Also the term "sensitivity" has no supportive documentation or relevance within the report. "Sensitivity" should be replaced with "Fragile" and "Very Sensitive" with "Extremely Fragile," which are terms documented within the body of the DEIS and relevant to the material discussion. Otherwise, the source of these terms should be referenced and their definitions provided.

N-3 Last paragraph: During follow up sessions, no concurrence was given or review conducted to determine eligibility for City of Seattle Landmark listing of properties that were not to be demolished. This should be clarified.

N-8 Historical Resources heading: The Green Line "would" have an impact and an adverse effect on more than one historical resource. Need to clarify this. Current statement reads only one property would be affected. The first paragraph under "Historic Resources" lists no properties as having an adverse effect from the project. This appears at odds with the findings of the Historical Resources Technical Report later in the Appendix.

N-134 First sentence of last paragraph is not a complete sentence.

N-161 Under Ballard Segment, 2nd paragraph, 2nd line: Delete phrase "of Historic Places" - redundant.

N-162 Under Downtown Segment: Revise to use correct terminology for the Pike Place Market Historical District (local) or Pike Place Public Market District (NRHP). Also correct the local/NRHP boundary discussion as noted above.

N-173 Table N-1: D-127 is eligible - see 8/7/03 letter from Allyson Brooks.

Appendix Q - Displacement & Relocation Backup Information

The property listed as the Forest Hotel - Plasma Center at 1521 2nd Ave. should be identified as the Green Tortoise Hostel.

The property listed as a residence at 3036 16th Ave. W. should be identified as the Interbay Animal Hospital.

The section on Potential Parcels Affected by Construction Staging does not identify what the uses of the properties are, as is done in the other sections of Appendix Q.

Q-4 This table does not provide specific information as to which parcels will be affected by a particular route, only those in the vicinity of the route. Additionally, it is not always accurate. For example, Pacific Science Center is listed under Alt 3.1, where it should not be, but not under 3.5, where it should be. How does SMP arrive at the numbers quoted in the DEIS from these tables. There should be an indication by each parcel as to whether a property acquisition would be required, and if so, if it is full or partial.

Appendix R - Noise & Vibration Backup Information

No backup information was provided in Appendix R for the vibration analysis and impact assessment.

Appendix R should provide a risk analysis methodology supporting the claims of "conservative" or "worst case" analysis and conclusions contained in Section 4.7 of volume 1.

R-1-6 The methodology for noise energy increase and decrease for modeling should be clarified.

Appendix S - Environmental Health Backup Information

Figure S-3 identifies a site, number 203 at 4th and Harrison (EMP turnaround) on the map of Documented EDR Release Database Sites, but does not mention it in the corresponding table on page S-5.

This section is confusing with respect to the health based guidelines, what they cover, and how they relate to the Monorail. Given scientific attention on AC magnetic fields, and concern about interference with pacemakers and implanted medical devices, the DEIS would be improved by including MBTA data on measurements of AC magnetic fields that are mentioned.

The conclusion that: "SMP will analyze the Green Line system in its built environment and will project magnetic field intensities, comparing results to applicable standards to ensure the safety of the public and monorail personnel" is vague. While accessible data on static and AC electric and magnetic fields from comparable transportation systems may be limited, some projections using assumptions about selection of system components is possible in the DEIS if insufficient information is available.

Looking specifically at how exposure to various components of the system could affect persons who rely on implanted medical devices appears warranted.

Mitigation: "Once a system is chosen, electric and magnetic field intensities will be confirmed and compliance with applicable standards will be ensured". Compliance with "applicable standards" is vague. Guidelines established by ACGIH and ICNIRP amount to recommendations. What standards will be selected? What steps will be taken to adopt standards and how will compliance be determined?

In lieu of analysis in the DEIS that reasonably demonstrates compliance with health based guidelines, a more specific statement on mitigation of possible impacts is needed. We suggest the DEIS state the DBOM contract will contain provisions requiring the contractor to demonstrate that all parts of the system comply with standards for exposure to electric and magnetic fields incorporated as specifications in the contract. The ETC would determine what those standards are based on existing guidelines.

S-1 "The primary electric and magnetic fields produced by direct current (DC) are static or stationary. Most standards for comparison of magnetic fields apply to alternating current (AC) sources of power, since frequency (measured in cycles per second or hertz (Hz) is related to magnetic field intensity (measured in gauss units (G)). However, DC-powered trains have equipment that produces alternating current (AC) fields (NIEHS June 2002)." This paragraph suggests a focus on alternating current magnetic fields, however most standards apply to direct current (DC) static magnetic and electric fields as well. ACGIH and ICNIRP guidelines cited in the DEIS have both published occupational exposure guidelines for static magnetic and static electric fields.

The guidelines and their components are complicated. The text needs to include enough information to be clear on: frequency range, whether occupational, public, and/or special population (pacemaker wearers) exposures are covered, and whether the guideline applies to both AC and DC electric and magnetic fields.

S-1 "The train control and communications systems would produce electric and magnetic fields and interference similar to radios." This statement seems out of place in the human health section except as it pertains to pacemakers and other implanted devices.

S-1 " Measurements taken along this system concluded that average static magnetic field intensities at coach seats range from 500 to 1,000 milligauss with maximum levels reaching 1,000 to 3,000 milligauss. Alternating current frequencies within the system exhibited lower magnetic field intensities." What were the AC magnetic field intensities? The ACGIH guideline for AC magnetic fields is one fifth of the guideline for static magnetic fields.

S-1 "Electric field intensities in similar situations were less than 10 percent of the ACGIH pacemaker exposure limit and approximately 1 percent of the ICNIRP guidelines for public exposure." In what situations? It is not clear whether the comparison being drawn applies to persons along the route or persons in the coach.

S-2 "Rail transportation equipment is capable of producing electric and magnetic fields at intensities high enough to affect some models of pacemakers and defibrillators. ACGIH guidelines recommend that workers with cardiac pacemakers not expose themselves to 60-Hz magnetic fields exceeding 1,000 milligauss or 60-Hz electric fields exceeding 1,000 V/m (Volts per meter)." Insert clarification "…AC 60-Hz magnetic fields…". Also, the ACGIH guidelines apply to static magnetic fields, recommending that 0.5 mT (5,000 milligauss) not be exceeded for pacemaker wearers.

S-2 "SMP will analyze the Green Line system in its built environment and will project magnetic field intensities, comparing results to applicable standards to ensure the safety of the public and monorail personnel." A description of the analysis that remains to be conducted is needed in the context of current guidelines. For example, will the Green Line be evaluated to determine if pacemaker wearers may be exposed to fields that would exceed ACGIH guidelines? What specific questions will be addressed in the analysis?

S-2 "DC is primarily a source of electric fields; magnetic fields from DC power sources are considered "minor". Minor in what sense? Measurements of static magnetic fields taken on MTBA coaches and contained in the DEIS are 500-1,000 mG average at the seats and 1,000 - 3,000 mG maximum.

Appendix U - Land Use Backup Information

U-1 When the Monorail is stated to be consistent with the multi-modal transportation system set forth in the CWPPs, at FW-18, please specify which part of the CWPPs.

U-1 It is unclear whether the SMP is saying that the Monorail project will service the growth contemplated by the Urban Village strategy after that growth occurs or if it is saying that the Monorail will promote and encourage development. If the latter, specific how. When the Monorail is stated to be "also consistent with the adopted land use plan of Seattle because it directs service to urban villages and to the Downtown urban core", please state which policies of the land use element of the Comp Plan this statement references. LG5 and L1 refer to promoting mixed-use development and encouraging that development in urban centers and villages. See also, comment on page U-4.

U-2 The statement is made that "it is important to examine the broad intent of a plan in determining neighborhood character as well as specific policies and regulations." However, on page 4-156, it is stated that development regulations are not being reviewed in this EIS. The development regulations should be reviewed in the EIS as called for in the City's SEPA Ordinance.

U-4 Second to last paragraph: The statement is made that a key component of the urban villages' strategy is to provide a coordinated transit system connecting urban villages. Please identify the specific land use or transportation policies that identify this as a key strategy. T11 is specifically cited, but it is not clear how the Green Line helps areas reach growth targets.

U-8 With respect to the statement that the Green Line is consistent with TG8, TG9 and T20 ("preserving the City's street capacity for other uses"), the next sentence states that the Monorail will cause some loss of on-street parking or lane capacity, both of which are key functions of the City's street capacity.

U-10 With reference to B1-P15, how will the placement of the Green Line in the right of way affect turning radii, visibility and sightlines and existing lane configuration?

U-10 With reference to CH/B-P9, how will the Green Line improve the contribution of 15th Avenue NW to the visual character of Crown Hill and Ballard?

U-11 Delridge: The statement is made that the station alternatives should "help further the goal of pedestrian-oriented development." Please explain specifically how this will be achieved.

U-12 First paragraph beneath policy DT-TP8 - states that "some public views along east-west streets could be affected uphill from Second Avenue…" In this case, "could" should clearly be "would" since views are affected.

U-12 First full paragraph. Statement: "Where financially feasible, the stations located largely outside the street right-of-way could have the least impact to the pedestrian environment." It is unclear whether or not this is a mitigation commitment.

U-15 Statement re: "The Green Line would assist with general access and mobility. GD-G9, GD-P21." However, these goals presumably refer to general freight access and mobility - see, for instance, GD-G12: "The transportation network in the Duwamish emphasizes the mobility of freight and goods." How does the Monorail assist with freight mobility?

U-15 Morgan Junction - statement concerning other buildings in the area being of similar height - see general comment in the Land Use section about quantifying the number of buildings to indicate whether there are a majority or even a significant minority of buildings in the area at the height of the proposed station structure.

U-16 The statement concerning alternatives further to the south "would not provide as strong a link or as great a change" - please clarify what type of change this references.

U-16 Statement that the "Green Line would promote policies promoting urban transit solutions", citing Policy QA-P33, mischaracterizes the policy, which calls for the transportation facilities and services to be consistent with Queen Anne's unique urban character, not for 'urban transit solutions.' Please provide analysis showing how the Monorail is consistent with Queen Anne's unique urban character.

U-16 West Seattle Junction: How would the Green Line assist with the goal of higher-density mixed use development at the Junction?

U-19 Typically, DCLU does not apply development standards to structures in the right-of-way

U-20 LG94: This policy is related to transportation networks and is not related to "visual" access to the shoreline. The Monorail does not provide physical access to the shoreline.

U22 and U23 No discussion or analysis of the Mercer Theater District Plan is provided.

U23 The statement "None of the Green Line alternatives would adversely affect the ability of the Seattle Center to carry out the Seattle Center Master Plan because the projects envisioned in the plan are now largely complete." is incorrect, as the Seattle Center Theatre District is part of the 2000 update, and has only completed the schematic design phase.

Appendix W - Tree Survey Backup Information

The information on trees in Seattle Center for Alternative 1 or 3 is incomplete. No data is present for height range, nor DBH range.

The basis for determining the number of trees "affected" is not provided; the basis should be provided. The survey needs to provide detail should on which trees are to be removed and which ones are to be trimmed.

W-3 East side of First Avenue North, south of Republican, behind Olympic Room -other trees include 4 Acer circinatum, 1 Catalpa bignoniodes, London Planes are in pits.
Upper Northwest Rooms courtyard - Sweetgums are 25-35 ft., in tree pits
Key Arena, northwest corner - Jacquemontii Birch, 15-20 ft., quantity = 9 in planter bed
Key Arena, northwest corner - Amelanchier laevis, 20-25 ft., quantity = 13 in planter bed
Key Arena, northwest corner - Pinus contorta, 15-20 ft., quantity = 9 in planter beds
Republican St. south side, between Warren and Second Ave. - London Plane height = 40'-50', in planter, other trees include 3 Acer circinatum, 1 Acer davidii, 1 Sorbus hupehensis, 1 Acer palmatum.

W-4 Republican St. north side, between Warren and Second Ave. - other trees include Quercus rubra, 30-40 ft. quantity = 1 in planter bed

Republican Street, south side, between Second Ave and Third Ave. - other trees include Fagus sylvaticus 'pendula', 30-40ft, quantity = 1 in planter bed, Robinia, psudoacacia, 40-50', quantity = 1 in lawn, 1 Abies koreana, 15-20', quantity = 1 in planter bed, Gleditsia triacanthos, 25-30', quantity = 1 in tree pit.

School district property: Memorial stadium tree border - there are dozens of additional trees and many more species in this area that are not reflected on the inventory, and that will likely be impacted by construction of 3.1 option

West side of EMP - these trees are Hornbeams (Carpinus betulus)

East side of Warren Ave. Republican to Mercer - London Plane trees are in the planter beds, not tree pits

W-6 In is unclear if the trees in the Segment called "Longfellow Creek Greenspace" are within the Yancy Street ROW or part of Parks department property called "Longfellow Creek Greenspace".

W-6 Segment beginning "SW Yancy Street..." is incorrect; no "lawn, by gym" in this segment.

W-8 North side of Mercer St. - between Second Ave. and Third Ave. - Not a Blue Spruce, but rather a Cedrus atlantica.

W-10 The quantity of trees (18-23) listed as impacted for Segments "35th Ave SW from SW Avalon…" and "35th Ave SW from SW Oregon…" is significantly under counted. Conservative estimate would be 45 trees over 40 feet.